



Recycling the Oil Boom

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Recycling the Oil Boom

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of North Dakota State University

By

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Thesis Abstract

This thesis provides some answers to the question, how can a small community sustainably adapt to a localized oil boom? The typology for this examination to the problem is a recycling center. The theoretical premise/unifying idea that guides the research is, “the small community must adapt to the demand of an oil boom but with a sustainable approach.” The project justification is, “If the small community doesn’t adapt to the demand of an oil boom it is likely to suffer socioeconomic collapse and environmental ruin. A sustainable approach is needed to ensure that the town’s infrastructure can adapt.”

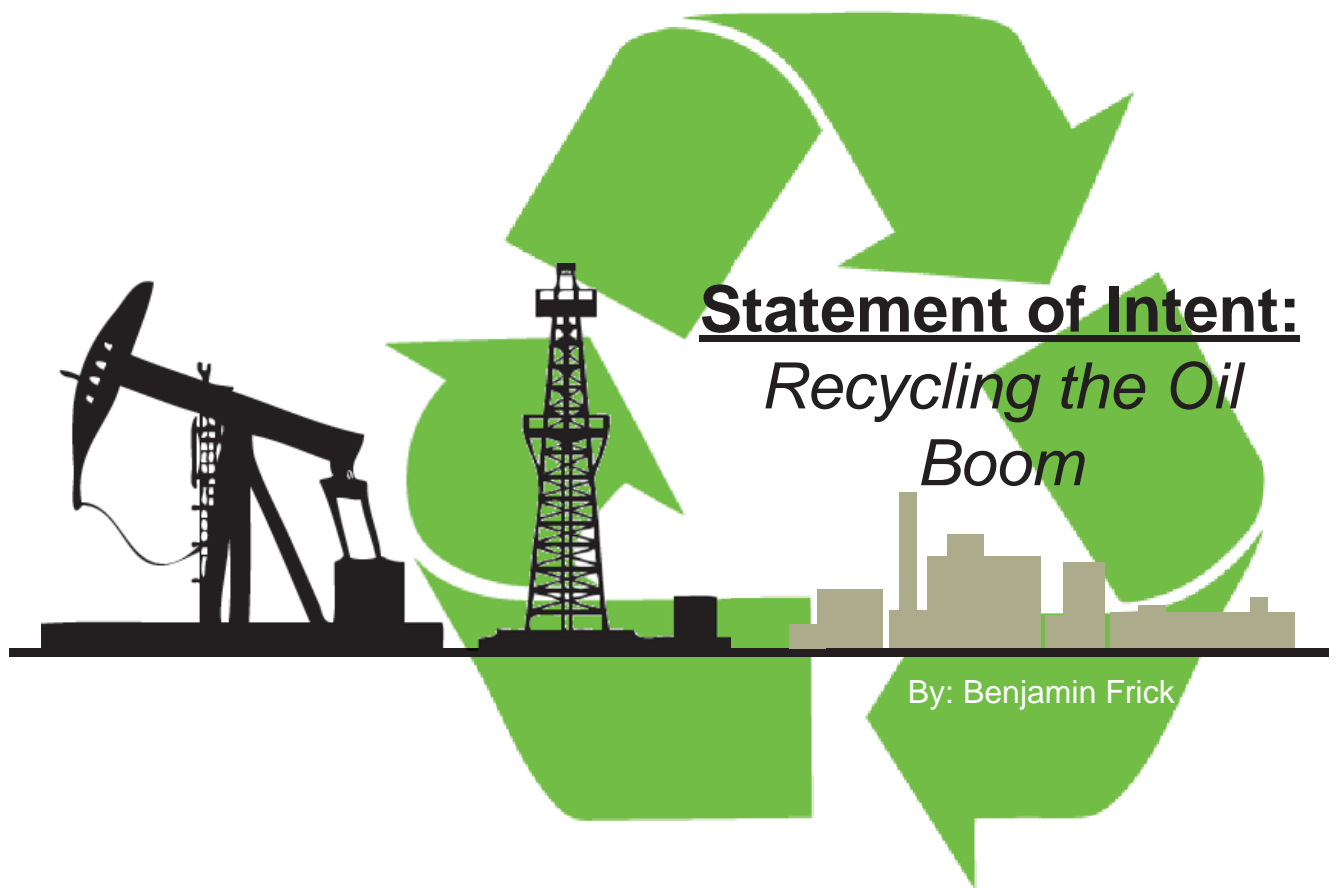
Keywords: Recycling Center, Small Community, Sustainability, Oil Boom



Thesis Problem Statement

How can a small community sustainably
adapt to a localized oil boom?





Statement of Intent:
*Recycling the Oil
Boom*

By: Benjamin Frick

The Statement of Intent

The Project Typology:

Recycling facility

The Claim:

With the newfound presence of an oil industry, a localized oil boom can be difficult for a small community to adapt to sustainably because of demands on the towns infrastructure.

Premises:

The amount of oil found and harvested determines how long the oil company will be in town, which also determines how large of a problem there is.

Boomtown communities have to adapt to large numbers of people joining the community for new jobs and economic growth while minimizing the demands on the infrastructure.

A community can be loosely defined as a coming together of people in a common place.

There needs to be some sustainable development within these small communities to ensure a healthy environment for all people living in these communities.

The Theoretical Premise/Unifying Idea:

The small community must adapt to the demand of an oil boom but with a sustainable approach.

The Project Justification:

If the small community doesn't adapt to the demand of an oil boom it is likely to suffer socioeconomic collapse and environmental ruin. A sustainable approach is needed to ensure that the town's infrastructure can adapt.





Proposal:
*Recycling the Oil
Boom*

By: Benjamin Frick

The Narrative

I am interested in creating a recycling facility for Stanley, North Dakota. This facility will provide the boomtown community of Stanley, the opportunity to adapt to the need for a larger infrastructure. The community receives a large quantity of cardboard through incoming freight deliveries for the commercial companies in town. This cardboard builds up very fast and has become such a large problem that the residents have to pay to get rid of this wasted material.

When a small community gets hit with a demand on its infrastructure it can be hard to immediately adapt to this change. My plan is to design a recycling facility that can be adaptable to these changes: when the oil industry arrives and when it leaves.

If the amount of oil found and harvested determines how long the oil company stays in town, how can a small community such as Stanley adapt to these changes? Does the oil industry itself recycle? If not, where does this waste go and could it be reused?

With large numbers of people moving into the community, what resources are being used the most? Is the only issue cardboard or could other wasted materials (i.e. plastic, wood, metal, concrete, etc.) be recycled? On top of that, could other nearby cities or companies use a local recycling system to reduce their own waste output in their own communities?

With the number of people outside of town coming in to work on the oil rigs, space is limited. People can get creative on where to sleep, but a lot of people have found refuge at local RV parks. Are the occupants of the park liable for their waste or does the city provide a waste service for them? This could serve as an opportunity to introduce recycling to outsiders.



The Narrative

There needs to be sustainable development within these small communities to ensure a healthy environment for all people living in these communities. With that, an educational piece will be introduced and used to inform and update the community on recycling.

This thesis will investigate and attempt to answer these questions about how a recycling facility is right for Stanley, North Dakota. It could also prove to be an example to other boomtown communities in the future.



The User/Client Description

The Client/Owner:

The city of Stanley, North Dakota.

The Users:

Staff of the Recycling Center:

In order to run the recycling facility the following positions will need to be filled: supervisors, managers, operators, fabrication technicians, maintenance crew, and class instructors.

Numbers:

Approximately 20 people will be needed to run the recycling facility and meet the local recycling demands of the community.

Peak Usage:

The recycling center will be open during regular business hours (with the exception of major holidays) Monday-Friday 9am-5pm and Saturday 9am-3pm.

Parking

Employees of the recycling center will park near the back of the building, allowing visitors and guests quick access to the main facility. ADA (Americans with Disabilities Act) parking will also be available close the main doors for those with special needs. Additional bus parking will be provided for field trip access.

ADA Accessibility

Along with parking spaces, the entire facility will be ADA accessible. This will provide opportunity for anyone, young or old to learn, work and visit within this recycling center.



The User/Client Description

Access for the Community

This recycling facility will be accessible to the community through a variety of resources, including drop-off recycling areas, an education center, public trails and gardens, and public tours of the facility.

Recycling Outside of the Community

A large concern for small communities is that they do not have the available resources to recycle. They may collect recycling at drop-off locations but once these bins are full they become a nuisance to transport. Often times these bins aren't worth the trip if the amount of money given for the recycled materials is less than the cost of the trip itself. One way this facility will help alleviate this chore is by providing a service to nearby communities for pick-up and delivery of recycle bins.

Recycling for Contractors

There are a lot of building materials thrown out daily on job sites. What better way to solve this problem then by providing local contractors the resource of recycling? Bins with labels would be provided to job sites and once they are filled they would be sent back to the recycling center. These materials would then be processed and recycled into new building materials contractors could buy back for later projects.

Visitors/Students

One of the components of this design is to educate the public with information about recycling. To do this, an education center will be included in the design for public lectures and seminars. Students and visitors of the community will learn how recycling can help the environment. Space will be provided for small and large class size field trips.



Major Project Elements

Building/Facilities:

Overall, this building will be built using sustainable materials and features that will improve energy efficiency, resulting in lower lifecycle costs than in a conventional building design. It will also be a model of what other buildings in the community could adapt to through the use of sustainable building materials. The following features will be integrated into the Recycling Center:

Entry/Circulation:

A way to enter/exit and circulate through the buildings.

Warehouse Building:

A place to store, sort and collect: Cardboard, Plastic, Aluminum Cans, Electronics, Metal, Wood, Glass, Paper and Confidential Document Shredding and Tires.

Transfer Building (Drop Off and Pick Up):

A designated area for the community to use as a drop off and pick up zone for recycling or building materials.

Offices:

Area for employees and staff to work which would also include: employee break rooms, employee locker/shower room and restrooms.

Display Space:

A space for local artists and children to display their artwork and possible competition pieces.

Parking/Bus Parking:

Designated space for incoming busses (tours, school, etc.).



Major Project Elements

Education Center:

Spaces to learn and become educated about recycling through interaction and lecture space. An auditorium, classrooms and lab spaces will be used for lectures, activities and class tours.

Baler and Recycling Space:

The main space where material is recycled into bales, later to be stored and shipped off to a facility for remanufacturing.

Compost and Biowaste

Used by the community as an area to remove unwanted composting materials and collect biowaste so that it can be stored and recycled correctly.



Site Information

Macro: Regional

Bing Maps - 1



Bing Maps - 2



North Dakota is part of the upper midwest of the United States of America located between Minnesota (east), Montana (west), Canada (north) and South Dakota (south). The western region of North Dakota is abundant in fossil fuels, including crude oil and lignite coal. Weather in North Dakota varies from season to season with cold winters and hot summers.



Site Information

Macro: City



Bing Maps - 3

Stanley, ND is the county seat of Mountrail County. Stanley was founded in 1902. It is situated on the Bakken Formation and is one of the main towns affected by the oil boom in north western North Dakota.

The city of Stanley has a total area of 1.7 sq. miles. The city is located off of U.S. Highway 2 and N.D. Highway 8, about an hour west of Minot, ND.



Site Information

Micro: Site



The site is located off of Reservoir Rd. on the north east portion of town. The water runoff reservoir is located directly to the east, and pumps to the water resource to the north of the site. This water is used by the community for fishing and watering the local golf course (located to the north).



Project Emphasis

This thesis will focus on how a small community adapts to an oil boom and how this effect can be accommodated in a sustainable way. Sustainable development is required within these small communities to ensure a healthy environment for all people living in these communities. There is also a possibility for economic gain through the resale of raw materials to local businesses and community members.



A Plan for Proceeding

Definition of a Research Direction:

To ensure that this project's research is done well and with great care, the following areas will be conducted in my research: the theoretical premise/unifying idea, the project typology, the historical context, site analysis and programmatic requirements.

Design Methodology:

This thesis will be following a mixed-method and quantitative/qualitative approach with a concurrent transformative strategy guided by my theoretical premise/unifying idea.

The quantitative research will be statistical and scientific data. This data will be found through research from the library, archives or other forms of local information. The qualitative research will be obtained through direct observation, surveys, interviews or other hands-on data collection.

The amount of data and research collected depends on the depth of research found on the theoretical premise/unifying idea's premises.

The integration of the data will occur at several stages in the process of the research and will depend on the requirements of the examination of the premises. My analysis, interpretation and reporting will occur throughout the research process and will be documented with written and graphic illustrations.

Documentation:

Physical and electronic documents (drawings, models, sketches) will be scanned or photographed to ensure they are kept on file. These files will be stored on hard disk and separate drives to fully establish a secure documentation of all of my work. Final documents and models will be documented in the same manner and kept in their own folder for later use. Documentation will be collected at several intervals when project goals are met through the year.

Scholars will be able to access this information through the digital commons located online and at the NDSU libraries. Hard copies of this thesis manual may be kept for viewing in the library or for check-out purposes.



Previous Studio Experience

Arch 271: Fall Semester 2007

Instructor: Darryl Booker
Tea House, Boat House and Dwelling

Arch 272: Spring Semester 2008

Instructor: Mike Christenson
Volume and Translation
Body, Site, Volume and Space Exercise
Group Community Project

Arch 371: Fall Semester 2008

Instructor: Ron Ramsey
Agincourt - Fraternity House

Arch 372: Spring Semester 2009

Instructor: Steve Martens
Kinesis Museum
Native American Community Center

Arch 471: Fall Semester 2009

Instructor: Don Faulkner
High Rise in San Francisco

Arch 472: Spring Semester 2010

Instructor: Don Faulkner, Darryl Booker and Kratky
Marvin Windows
Slum Housing for Santo Domingo, Dominican Republic

Arch 771: Fall Semester 2010

Instructor: Ganapathy Mallingham
Research Project: Cost Estimation and Specifications





Program:
*Recycling the Oil
Boom*

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Theoretical Premise Research

...a monstrous surrounding of
gathering - the putrid, the castoff, the used,

the mucked up - all arriving for final assessment,
for the toting up in tonnage, the separations

of wet and dry, returnable and gone for good:
the sanctifications, the burn-throughs, ash free

merely a permanent twang of light, a dwelling
music, remaining: how to be blessed are mechanisms,

procedures that carry such changes!

A.R. Ammons, *Garbage* (125)

On August 11, 1971, the town of Franklin, Ohio, opened the "World's First Garbage/Trash Recycling Plant" according to the *Franklin Chronicle*. It was then that residents of the small industrial town realized that recycling was needed. The company behind this, Black Clawson Company, recovered glass, sand, paper and metals, shredding the residue into small particles and whisking it into a 1500° burner (Kelly 1973).

However, this wasn't the first garbage machine to be built. In 1884, "a strange machine" was installed at New York's Jackson Street wharf. Designed to "turn street sweeping and house refuse of all sorts into money," this machine separated materials by shaking them, screening them, and putting them in water to float or sink. Italian immigrants finished the job, picking out usable materials off the conveyer belt (Strasser, 1999, 130-31).

The difference between Franklin, Ohio and New York was not just time, but the broader public acceptance of recycling. Around 1971 hundreds of small American towns opened more modest recycling centers. According to Engler, author of *Designing America's Waste Landscapes* (2004):

Over the past three decades, large and small American cities have witnessed the birth of waste redemption institutions of all sorts and names - recycling centers, recycleries, material recovery facilities, resource recovery plants, material redemption sites, community material resource parks, drop-off sites, buy-back centers, and refund centers (125).



Theoretical Premise Research

Recycling, in and of itself, is self-rewarding. Just placing a can or bottle in a designated recycling container makes people feel good about themselves because it's considered the "right thing" to do; in fact, "In the United States, recycling...has become a normal, almost ubiquitous activity (Engler, 2004, 125). According to an article written by Nora Goldstein and Celeste Madtes in 2000 called "The State of Garbage in America", the national recycling rate was 32 percent (in 2000) compared to 8 percent (in 1990). Also, 133.2 million Americans (61 percent of the population) receive curbside recycling service.

Politically, recycling is a very controversial issue. Both sides would agree that recycling can be valuable; however, they disagree on how it should be used. Avid recyclers would argue that recycling conserves natural resources, prevents pollution caused by the processing of either raw material or garbage, saves energy and landfill space, and produces a sense of community involvement and responsibility. Their opponents, however, attack recycling on economic, environmental, and even moral grounds, which brought about a 1996 *New York Times Magazine* cover story titled "Recycling is Garbage." In it, John Tierney argues "most recycling efforts are economically unsound and of questionable environmental value. Recycling requires a complex industrial process more costly than landfilling, creates additional pollution, distorts free-market objectives and efficiency, and diverts federal funding that could be used to subsidize more worthy environmental causes." These advocates support programs that conserve their resources and renew biomass materials along with making the manufacturers more responsible by using less packaging and creating new sustainable products (Tierney, 1996, 44).

A good example of a local recycling program is the Mall of America in Bloomington, Minnesota. "...the ultimate symbol of America's consumerism, allocates a special store to promote recycling and takes an active role in America Recycles Day" (Engler, 2004, 127). The store labors to show off its "green" virtues, exhibiting information on the recycling bins and collection system within the mall, and, of course, selling "postconsumer" products year-round.



Theoretical Premise Research

Psychologically and socially, recycling demonstrates how we think about the environment and about the consequences of our actions. According to Engler, when talking about the psychology and sociality of recycling,

Early studies in the 1960s found that financial inducements (i.e. refunds for cans, payment by weight) were a major factor in recycling habits. Studies in the 1990s however...motives related to personal satisfaction, such as self-sufficiency, making a difference and being part of the community, [were factored] as more critical (Engler, 2004, 129).

It is important to note that these studies were done on the middle-class and “recycling may be commonly understood as a middle-class altruistic behavior guided by social and personal norms” (Hopper & Mielsen, 1991, 195).

“Recycling” has different meanings to different groups. For instance, a garbage producer places the waste in a designated container for removal by the recycling truck. For the consumer, recycling means the production of new post-consumer goods, meaning it physically gets separated from the garbage intended for landfilling or incineration and is reprocessed into new material resources. Dictionaries define “Recycle” as “to pass through a cycle again; repeat a process from the beginning” (*Online Etymology Dictionary, 2010*). The prefix, *re-*, meaning “again” or “back” combined with *cycle* doubles the meaning of the root word, which already means a recurring pattern of events or phenomena. The word “recycle” was coined in the 1920s, and it referred only to the reuse of materials in an industrial process, such as returning gasoline produced as a by-product back into the system. It was first applied to discarded waste material in the 1960s. From the consumer’s perspective, recycling is a process that re-creates entirely new goods while eliminating the threats and stigma attached to used goods. Recycling is founded on the premise that an item’s condition as waste is not inherent or absolute; rather, waste can acquire a new, value-added status (Engler, 2004, 132). According to social scientist Michael Thompson, for a waste object to transcend its waste status and acquire value, three transformations are necessary: its life span must increase, it must emerge from obscurity or anonymity, and its polluting properties must be removed (1926).



Theoretical Premise Research

Used and reused things seem polluted on both sensory and symbolic levels. Used things smell and look unclean, gray, and a little greasy. We don't like to touch what other humans have handled or used because of our fear of contamination. According to Terence McLaughlin in *Dirt* (1998): "if we happened to touch them or even smell them...[we fear] that these unknown people who have been in place before us may somehow infect us with their own diseases and shortcomings" (5). Another symbolic contamination draws on the sexual metaphor of exclusive possession: used things have a non-fresh, non-virgin quality (Lynch, 1972). Garbage itself looks very unorganized and lacks a pattern, but as you separate recyclables into their own bins they start to exhibit a kind of specificity. After doing so they can be remanufactured into reusable goods. The public then ignores the old "infected" look and smell and accepts the new product.

Garbage can be defined as something that is unwanted or not needed anymore, but with recycling, old garbage can be created anew. In a typical landfill, glass can last up to 100,000 years while organic waste may wither within days. In contemporary culture, which develops and loses desires quickly and assumes that objects should be enjoyed briefly and then thrown away for newer and improved replacements, recycling has been given the authority to use technology to recover objects, to extend their useful and meaningful life (Engler, 2004, 133).

The second law of thermodynamics, entropy, implies that everything in the universe begins with structure and energy and is moving toward random chaos and decay, and therefore waste. As a human race we try and slow this process down, and one way to do that is by recycling. By taking waste and reproducing it for a new use, we are slowing down the second law of thermodynamics to lessen the blow on society.

The discussion on the need and means to counter entropy is ongoing. The solutions that society has put forward, all economically, politically, socially, and ideologically bound, have shaped myriad places of material exchange (Engler, 2004, 134).



Theoretical Premise Research

It's amazing to see and hear about what people throw out. Sometimes even sanitation workers refuse to allow certain things to pass and retrieve objects from large amounts of garbage on its way to the dump or recycling center. Objects are even saved and put up as trophies in lounges or storage spaces, depending on their worth. According to Engler, at some recycling centers, workers picking through the fresh garbage on conveyor belts extract numerous treasures and mementos, including wedding rings and currency (sometimes hundred-dollar bills). The manager of the Hiriya dump in Tel Aviv proudly exhibited his coin and gun collection to visitors, and the workers of Haruvit dump, near S'dot Micha filled their trailer office floor-to-ceiling with sexual paraphernalia, including pornographic magazines and images, all found in the dump. There are some who see beauty in garbage and use these thrown away items to produce artwork. They are known mostly as folk artists; however, the French called this practice *bricolage*, meaning tinkering or the work of a putterer. The three most famous and most publicized folk artists are Howard Finster's Paradise Garden in Pennville, Georgia; the Rock Garden of Nek Chand Saini in Chandigarh, India; and the famous towers built by Simon Rodia in the Watts neighborhood of Los Angeles (Engler, 2004, 152).

Like *bricoleurs*, architects have experimented with structures of salvaged waste to solve social and environmental problems. Two architects, Martin Pawley and Mike Reynolds, have made a systematic effort to employ disused materials in affordable and environmentally sensitive buildings. Since the early 1970s they have experimented with house prototypes from discarded tires, crates, beverage cans, and bottles. It was Reynolds who took a hands-on approach and experimented with new techniques, like filling old tires with dirt for a foundation of his famous Earth Ship home (Wilson, 1993). Pawley, however, has been a critic of the recycling industry and in his books, *Garbage Housing* and *Building for Tomorrow: Putting Waste to Work*, he explores the possibilities for taking the large amounts of waste produced and using it in a cost-effective and sustainable building construction. However, he does stress the idea that these secondary-use structures need to be given a dignified identity in order to avoid the stigma of secondhand materials.



Theoretical Premise Research

Both Pawley and Reynolds participated in the first and only International Conference of Garbage Architects in Florida in May 1979, where the issues of low-cost dwellings and conservation practices related to housing were raised (Pawley, 1982; Wilson, 1993). In the 1980s, however, housing for the poor was forgotten and bricolage remained merely a source of romantic allure and inspiration, having no impact on popular architecture. Only a few architects ventured into the secondary use of building materials - primarily in low-cost, experimental housing, and often in nonconformist high style (Engler, 2004).

Projects concerning the design of recycling facilities fall into three groups - privately-owned, publicly-owned, and grassroots and/or nonprofit. Privately-owned corporations use small, physical, educational gestures to appease adjacent communities and satisfy popular "green" public elements. Public projects, on the other hand, offer artists and designers greater freedom and enable them to create civic architecture and shape how waste facilities are perceived. Finally, grassroots and/or nonprofit organizations open up an unlimited range of possibilities for addressing social and environmental problems, as well as creating productive and vital public spaces for the community (Engler, 2004). Overall, they all have positive and negative aspects, and in the following few pages each category will be addressed with project examples and critiques for each.

The Sanitary Fill Solid Waste Transfer and Recycling Center is located on top of a closed landfill in southeast San Francisco. It is a privately-owned recycling center and started its operation as a conventional transfer station in the late 1960s. The plant today reclaims more than a dozen different materials from sorted and unsorted waste, including toxic waste. The building itself is a plain-looking recycling and transfer facility with a special garden and art program. The three-acre sculpture gardens, named River of Hopes and Dreams, occupies an edge zone abutting the lower-class neighborhood Little Hollywood and is known only to neighborhood residents, workers and visitors shown through organized tours (Engler, 2004).



Theoretical Premise Research

The garden serves as a place for employees' lunchtime and breaks, for organized picnics, and for educational programs and tours. It also provides a buffer for residents in nearby homes, alleviating the sensory nuisances and reducing mental strain. Unfortunately, access to the garden is restricted, and there is no direct entry from adjacent streets (Engler, 2004). There could be so much more done with this garden if it was opened to the public or even just the neighborhood. Local schools and artists could use some of the wasted material from the facility to produce a new addition to the gardens, but since it isn't open this isn't a possibility. Another downside to the facility is that it has no relation to the garden besides its use for breaks and at times has been said to hinder work ethic at the plant.

In contrast, the 27th Street Solid Waste Management Facility does allow public access, and it has become a major draw even for tourists. The 1993 opening of the Phoenix recycling and transfer facility attracted a few hundred curious and proud residents, who attended a picnic and dance at a newly built civic palace. A design team led by Linnea Glatt and Michael Singer worked with the engineering firm Black and Veatch to create this facility. They crafted solutions to site layout, employee space, public access, and construction details and developed a comprehensive program that encompassed a garbage transfer facility, recycling activities, self-hauled material recovery, vegetation mulching, and education and demonstration programs (Engler, 2004). Overall, it is a great architectural piece of art, and architectural critic Herbert Muschamp describes the interior as "Translucent panels and skylights bathe the interior with Gothic light. The effect is not pretty. Instead, the artists have reached for awe" (1993). The project has won many awards and dozens of newspapers and magazines have praised it as a new model for the integration of architecture, infrastructure, and public art (Engler, 2004).



Theoretical Premise Research

One of my personal favorites is BRING Recycling. BRING (Begin Recycling in Neighborhood Groups), is located in Eugene, Oregon and in December of 2001 (it's 13th birthday), BRING was ready to expand to a new location. In 2007, they moved to the "Planet Improvement Center." In December 2010, BRING celebrated its 19th birthday. BRING promotes reuse as a basic strategy for achieving a sustainable future and prides itself for luring to its junkyard-style facility many area residents who are not "typical" environmentalists (Engler, 2004). Their website (<http://www.bringrecycling.org>) is very informational and involves a virtual tour .

BRING expanded and started to process materials from all over Lane County at a central location called, The Dump. It also offered information to local residents (taking up to 150 phone calls a week) and provided educational programs in schools. Then, when recycling took off in the 1980s, BRING turned its focus to reusables. According to BRING, in 2001, 21 well-paid employees processed, sold recyclables and reusables, provided a building tear-down service and work shops, and managed one of the most popular and extensive reuse warehouses on the West Coast. In 2001 at least 650 bathtubs and showers, 1,600 doors, 375 sinks, 500 toilets, and 1,000 windows were salvaged and put back to use. The organization is self-sustaining and it was projected that its operation would double by 2004 (Engler, 2004; BRING, 2010).

The Resource Center has become a vehicle for teaching and empowering people through sustainable living practice; BRING has become a sociable and entertaining place for creative spirits and environmental education (Engler 172).



Theoretical Premise Research

Summary

In my Theoretical Premise/Unifying Idea research, I studied recycling's Architectural Theory (Historicism and Typology), Social Sciences (Psychology, Politics and Linguistics) and Hard Science (Physics: Thermodynamics) to better understand how recycling affects small and large communities. It is a very controversial issue and through my research I have found many resources to further my thesis.

Recycling goes back much farther than 1884, but it wasn't until then that recycling centers began to emerge. Starting around the 1970s, recycling became an important part of people's lives and still is to this day.

Politically, recycling is a very controversial issue and while both sides would agree that recycling can be valuable, they disagree on how it should be used. Avid recyclers would agree that recycling conserves natural resources, prevents pollution caused by the processing of either raw material or garbage, saves energy and landfill space, and produces a sense of community involvement and responsibility. Their opponents, however, attack recycling on economic, environmental, and even moral grounds.

Psychologically and socially, recycling shows how we think about the environment and about the consequences of our actions. Recycling, in and of itself, is self-rewarding, yet used and reused things seem polluted on both sensory and symbolic levels. Used things smell and look unclean, gray, and a little greasy. We don't like to touch what other humans have handled or used because of our fear of contamination. However, just placing a can or bottle in a designated recycling container makes people feel good about themselves because it's considered the "right thing" to do. It was interesting to find that recycling is, for the most part, a middle-class activity and a normal, everyday occurrence.



Theoretical Premise Research

Linguistically, “recycling” has different meanings for different groups. For instance, a garbage producer places the waste in a designated container for removal by the recycling truck. For the consumer, recycling means the production of new post-consumer goods, meaning it physically gets separated from the garbage intended for landfilling or incineration and is reprocessed into new material resources.

Scientifically, the second law of thermodynamics implies that everything in the universe begins with structure and energy and is moving toward random chaos and decay and therefore waste. As a human race we try and slow this process down and one way to do that is by recycling. By taking waste and reproducing it for a new use (recycling), we are slowing down entropy to lessen the blow on society.

Typologically, projects concerning the design of recycling facilities fall into three groups: privately-owned, publicly-owned, and grassroots and/or nonprofit. “Grassroots and/or nonprofit” groups help the community by being there merely as a resource for the community, not closed off to the public like a privately-owned recycling facility might be. That’s not to say all are like that; however, it is the grassroots and/or nonprofit recycling facilities that tend to be more open to local artists, educating the public and being a resource for builders/contractors.

Overall, a recycling center should provide the public with local art, education, and reconnect the old with the new, providing a resource that has a greater impact than just one small community. From my personal experiences and research, I have found that the reason more people don’t recycle is because of the social and psychological stigma that goes along with used or thrown away objects. Overall, this research has given me some insight into how people view recycling and how, throughout history, recycling has become more of a self-rewarding act than a chore. There is an inherent beauty in recycled goods and the outcome can be rewarding if done correctly.



Case Studies

Case Study 1 - MACHIDA RECYCLING CENTER

Takenaka Komuten Co. : Architects + General Contractors

Ishikawajimaharima Heavy Industries Co.: Plant

Color Planning Center: Color Planning

Location: Machida, Tokyo

Building type(s): Recycling Center and Trash Disposal

Building Size: 12,120m² (130459.68 ft²)

Site Area: 82,350m² (886415.39 ft²)

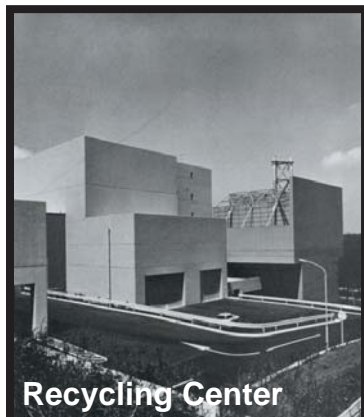
Total Floor Area: 22,216m² (239133.02 ft²)

Completed: May 1982

Structure Type: Reinforced concrete and steel frame

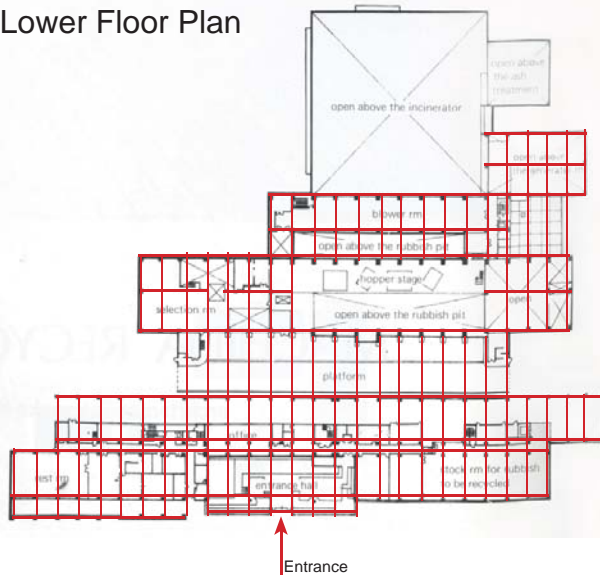
Short Description:

Located in the suburbs of Tokyo, this trash-disposal plant makes use of thermal heat produced in incineration, experiments with converting certain kinds of rubbish into fertilizer, and recycles all discarded objects that can be put to some good use. It includes a hothouse filled with tropical plants grown using heat produced by burning trash, a display hall for recycled articles, a large research center, and a handicraft department where discarded articles are repaired and improved for reuse. It is functionally divided into three blocks: the incinerator, the recycling center, and a life-planning center where training room and displays show how recycled objects and trash-generated thermal heat can be used. The recycling center, the symbol of the entire project, is on the south side. Lines of access to it are clearly separated from those for the trash disposal plant, which opens on the road on the west.

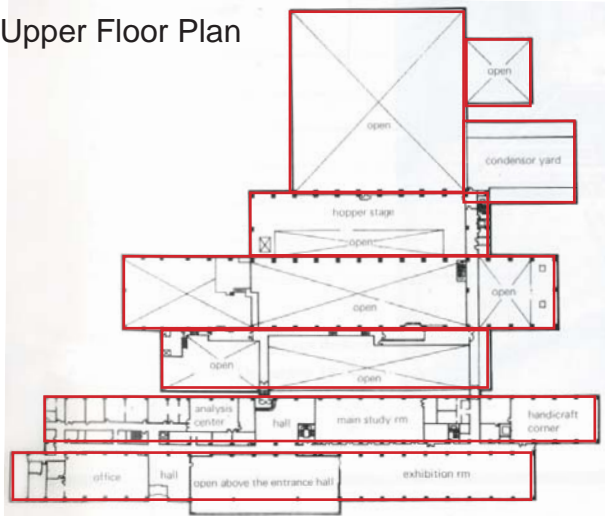


Case Studies

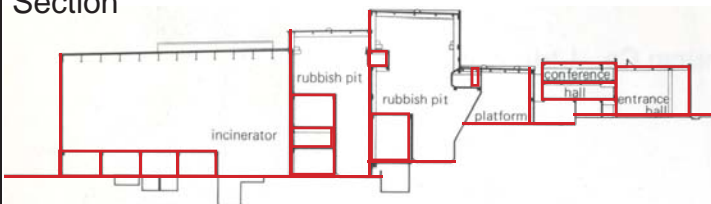
Lower Floor Plan



Upper Floor Plan



Section



Summary

Overall, this waste recycling center is created purely as a functional building except for the main entrance used to hide the large, facility in the back half of the design. In relation to the theoretical premise/unifying idea, for how long ago this building was designed, it is interesting to see the experiments and design decisions made by the architects.

Structure

The strong structural grid creates very large open spaces for machines and work space. Each structural element is part of a unit of a whole; one cannot function without the other.

Natural Light

There is a large curtain-wall system of glass to illuminate the entrance, offices and exhibition rooms at the entrance of the building. Other than that, there isn't much natural light penetrating the interior work spaces.

Massing

There are five or six large mass areas where waste is sorted and recycled and two small mass areas with multiple primary and secondary elements (offices, restrooms, etc.).

Plan to Section/Elevation

Section information largely impacts the floor plan (and vice versa) due to the large nature of space needed for machines and work area.

Circulation to Space

Most circulation spaces are very functional in that they only provide circulation from one area to the next. No elements are celebrated while using this space.

Geometry

The geometry is very functional in its use, creating grid patterns and giant open spaces for machinery.

Additive or Subtractive

The floor plans show additive to be the main process to this design. However, looking at the section, the conference hall has a subtractive attribute in that it is dropped into the building sitting up above the entrance hall. The functional building design is both additive and subtractive.



Case Studies

Case Study 2 - Warren Skaaren Environmental Learning Center at Westcave Preserve

Jackson + McElhaney Architects

Location: Round Mountain, TX

Building type(s): Interpretive Center, New construction

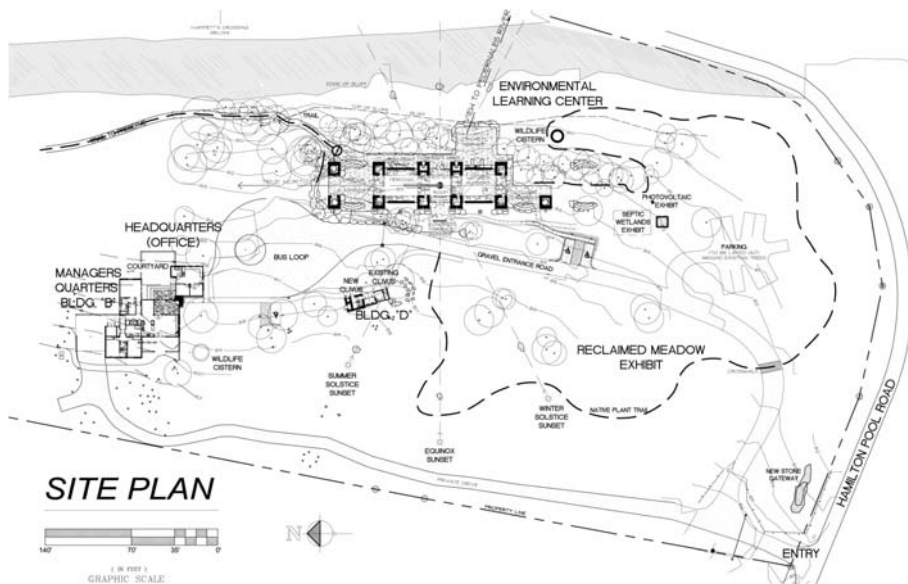
Size: 3,030 sq. feet

Completed: March 2003

The building opened to the public on the vernal equinox, March 22, 2003.

Short Description:

The Warren Skaaren Environmental Learning Center functions as a visitor center and classroom space for public and school programs at Westcave Preserve, a 30-acre nature preserve in south Texas. The building had to be able to accommodate groups of 150 or more students while hosting visitor groups of one to ten people and serving as a community center. The project goal was to foster respect and stewardship of the natural environment, support environmental education, and preserve the sanctuary into the future.



All case study images, drawings, and information from
AIA/COTE "The Warren Skaaren Environmental
Learning Center"

Case Studies



Water

Water quality and water cycles are demonstrated through the use of a rainwater collection and filtration system. Wetlands and Clivus Multrum (a self-composting restroom) wastewater systems show recycling of materials in nature (AIA/COTE, 2006).

Air

Natural ventilation, orientation and a weather station illustrate the physics of air currents and air quality at the site. (Ventilation fans, high/low operable windows) (AIA/COTE, 2006).

Geology/Earth

Stone walls illustrate fossils of local sedimentary stones. A panel exhibit shows how the canyon was formed more than 250,000 years ago (AIA/COTE, 2006).

Energy

Sustainable energy systems such as a photovoltaic array, ground source heat pumps, daylighting, R-30 cellulose insulation, large over-hangs, attic fans and efficient lighting are integrated into the building. An interactive panel shows how these sustainable energy systems can be controlled to balance energy demand with incoming "clean" solar power (AIA/COTE, 2006).

Seasonal Cycles

Seasonal cycles are illustrated by a meridian line and sky map embedded in the terrazzo floor marking the sun's motion (correct to atomic time) during the seasons through an aperture in the ceiling (AIA/COTE, 2006).

Nature's Numbers

Also embedded into the terrazzo floor, this exhibit illustrates the enigmatic relationship between the Fibonacci Series, golden rectangle, logarithmic curve and the form of a 90 million year-old ammonite (AIA/COTE, 2006).



Section A

POLE STAR ALTITUDE
EQUAL TO LATITUDE: 30.7° N

23.4°

ALTIMETER OF SUN
AT NOON

SUMMER SOLSTICE (23.4° ALT.)

WINTER SOLSTICE (6.6° ALT.)

PHOTOVOLTAIC CELL
TRACKS SUN
ACROSS THE SKY

30.7°

WINTER SOLSTICE
December 21

SUMMER SOLSTICE
June 21

EQUINOX
Sept 21

EQUINOX
Mar 21

THE DECLINATION IS THE
DIFFERENCE BETWEEN
MAGNETIC NORTH AND
TRUE NORTH

MAGNETIC NORTH

TRUE NORTH

6"

EQUATION OF TIME
ANALEMMA

meridian line

PM

AM

THE IMAGE OF THE SUN
CROSSES THE MERIDIAN LINE
EACH DAY AT SOLAR NOON

LOCATION OF
RISING SUN ON
HORIZON

SOUTH

WINTER
SHADING
SHADOW

AMMONITE
IN FLOOR

SUN ALIGNMENT SLOT

SUN CHART
DESCRIBED IN
FLOOR

LOCATION OF
SETTING SUN ON
HORIZON

WINTER
SHADING
SHADOW

PHOTOVOLTAIC
EXHIBIT

meridian

SECTION B-B

SECTION A-A

PLAN AND SECTIONS

50' 20' 10' 0'

N

The structure of this building is dependent on 11 columns which create each space on a grid and symmetrical pattern. This allows for many open spaces for tours and activities, creating space for a wide variety of classes.

There is a great deal of natural light in this building and with both outdoor and indoor spaces, it is easy to mix between the natural and built environment. The building itself also functions off of light in the form of a sundial cast over the floor and marked for different phases through time.

The form of the building is determined by the floor plan and gives a sense of symmetry and balance throughout the design. As shown in section C on the next page, the building itself is very symmetrical.

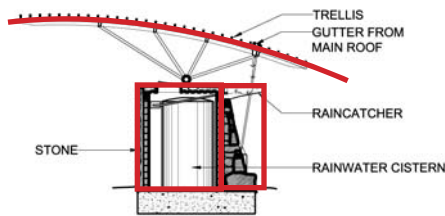
The plan, in this case, is used to organize activities for tour groups and often generates the final form of the design.

This design uses a very linear circulation in which spaces are linked together to create a uniform whole.

Use of squares and rectangles is very common in this design, creating studies of the Fibonacci number series and angles of the sun, which create a great learning environment for children.

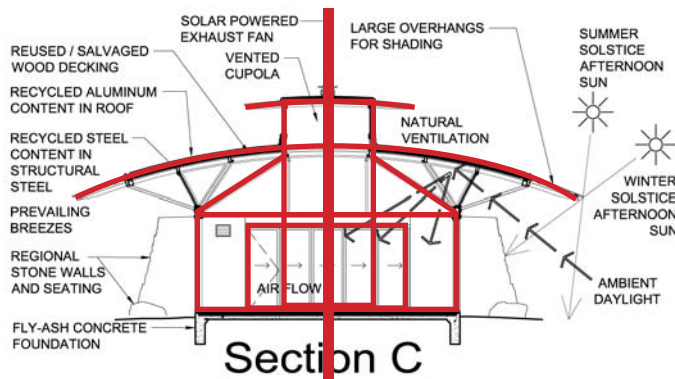
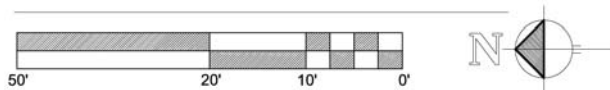
The center space of the design, outlined in section and plan, is the most important space due to the relationship between the center tower and the floor sun diagram.

Case Studies

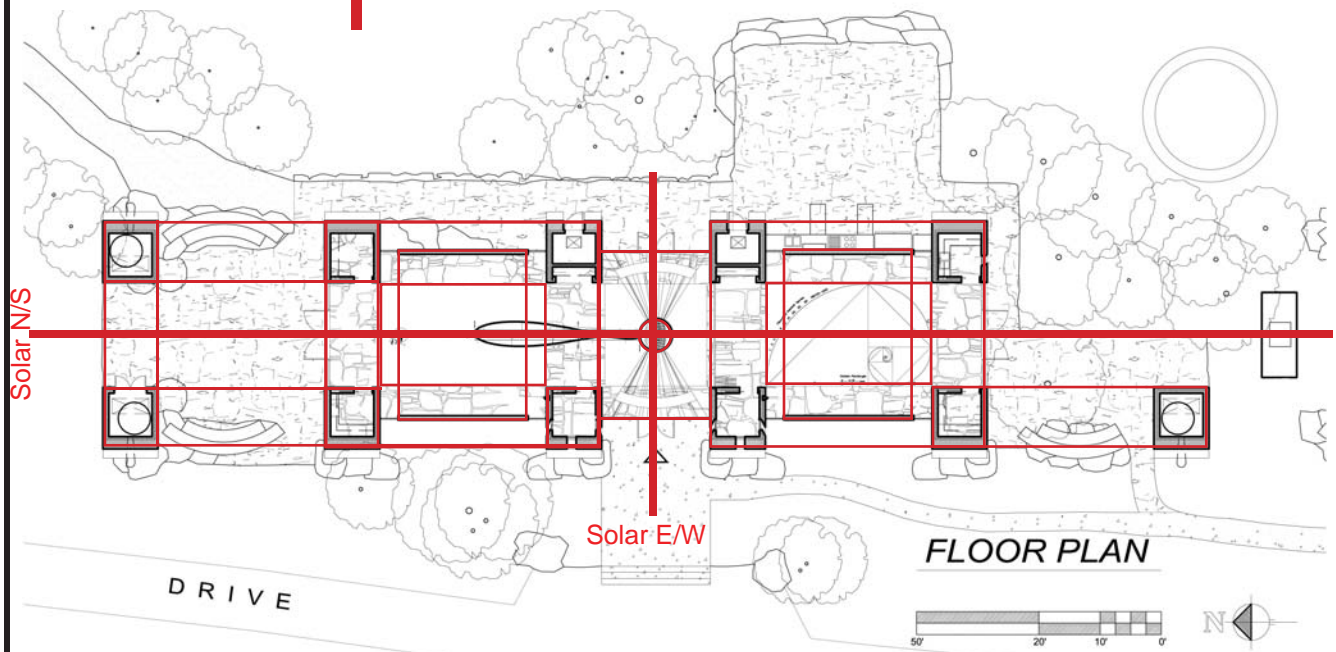


Section B

SECTIONS



Section C



FLOOR PLAN

Conclusion

As a whole this building functions in a very educational way. The building itself teaches environmental strategies, preservation and overall sustainable practices to anyone who experiences the space. The Environmental Learning Center provide many solutions for sustainable design, of which is part of the theoretical premise/unifying idea.



Case Studies

Case Study 3 - Materials Recycling Facility (MRF)

DiMarinisi + Wolfe

Architects/Urban Designers (Boston, MA)

Location: Springfield, MA

Building type(s): Materials Recycling Facility (MRF)

Site Size: 120,000 ft²

Completed: 1990

Short Description:

Located in Springfield, Massachusetts, this recycling facility was designed for the community and with great consideration of the surroundings. First, the layout of the recycling machinery was resolved before the enclosing structure is designed. Second, due to community concern, zoning constraints required for a masonry street facade without any truck entrances. The long narrow site rendered a one-way loop the best way to route the deliveries; they are weighed on a platform scale in front and unloaded into bins and processors in the back.



Project Vision: An Industrial Basilica

Maury Wolfe, project architect for the plant, emulated Peter Behrens Turbine Hall in Berlin, which uses traditional references to give the industrial building a civic presence. Wolfe envisioned the plant as a positive part of Springfield's urban image, with allusions as optimistic as those of a turn-of-the-century factory. The basilica, a centuries-old prototype for public buildings, was the model for both Behrens and Wolfe. The arched roof and masonry piers have monumental implications, and steel windows and columns add utilitarian connotations. Wolfe notes that the three-tiered facades correlate with those of a Gothic cathedral. A band of glazing surmounts panels of unit masonry and a base course of smooth concrete. But here, as in the Turbine Hall, the massiveness of the walls is associative, not structural. The masonry is infill, not load bearing, and the expressed steel X braces are essential for lateral support.

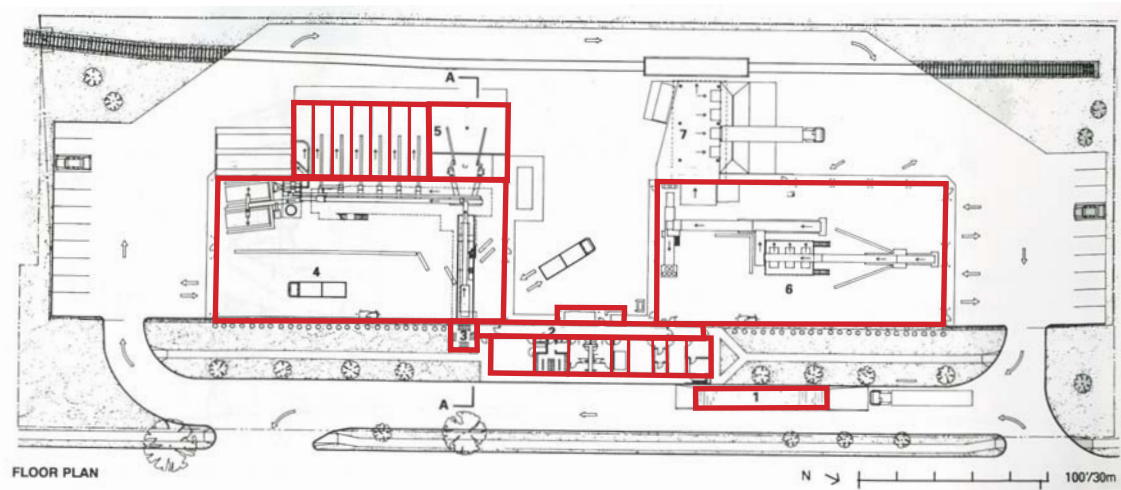
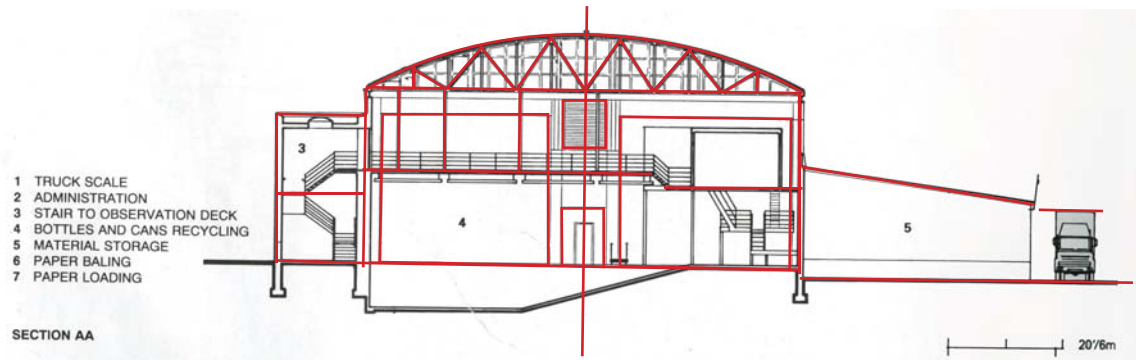


Behrens Turbine Hall in Berlin



All case study images, drawings, and information from
"An Industrial Basilica: Materials Recycling Facility."

Case Studies



Case Studies

Structure

In order to give the industrial recycling center a civic presence, the architect used pieces of Peter Behrin's Turbine Hall in this design. The arched roof and masonry piers have monumental implications, and steel windows and columns add utilitarian connotations; however, the massiveness of the walls is not structural, instead it is used in association to its surroundings.

Natural Light

Piercing through the steel windows high above, natural light illuminates the interior from all cardinal directions.

Massing

The building itself is massive, consisting of two large rectangular buildings, both of which have curved roofs.

Plan to Section/Elevation

As stated above, the layout of the recycling machinery was resolved before the enclosing structure was designed. This shows how important the machinery is to the design and how it influences size and layout of the floor plans.

Circulation to Use-Space

Most, if not all, of the design is use-space where circulation is strictly functional for workers. The orientation of the buildings was also determined by the use-space and its orientation to the street facade so incoming and outgoing trucks would not be seen by nearby residents.

Geometry

Most of the complex consists of two large rectangles and two large arched rooftops. The front of the building (office space) is also rectangular in design and form but is designed more at the human scale.

Additive or Subtractive

Through these massive buildings are holes subtracted through the sides where large garage doors are used for circulation. This allows for a non-restrictive entry/exit for vehicles.

Summary

Overall it is a very functional building with little to do with sustainable design. It was a good study to undertake and showed how massive the equipment is and what process a Materials Recycling Facility (MRF) uses to produce recycled goods.



Case Studies

Quick Study - Planet Improvement Center

DiMarinisi + Wolfe

Architects/Urban Designers (Boston, MA)

Location: Eugene, OR

Building type(s): Planet Improvement Center

Site Size: about 145,800 ft²

Completed: 2007

BRING's Mission

To help people understand how the stuff we use shape the planet we share.

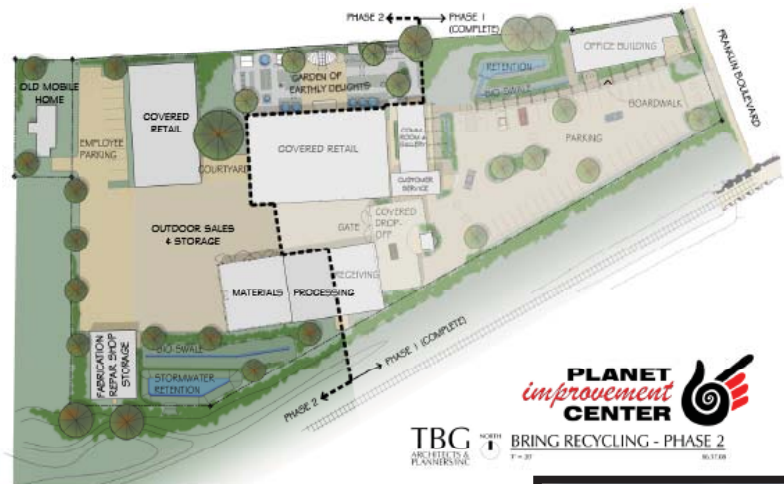
They provide conservation education in the schools and community; recycling information and services; expertise for businesses; and a resale outlet for used building materials.

Building Design and Phase 2

The buildings are simple designs, however, they implement sustainability, great circulation and a variety of public goods, including convenient all-weather shopping, quality materials (sorted, priced and easy to find), drive-through drop-off and loading, ample paved parking, bioswale for on-site storm water management, the BRING Gallery and public education space and examples of reuse and sustainable building.

In the next phase, currently underway, many things will be added, including additional covered retail space, materials processing shop, covered trash/recycling station, second bioswale (for 100% on-site storm water management), paving and infrastructure, warehouse renovation and Garden of Earthly Delights (an outdoor learning/gathering space).

Overall it is a very interesting facility that really connects to the community and local businesses. This center will be studied more in the future through plans and sections not available at this time.



Case Studies

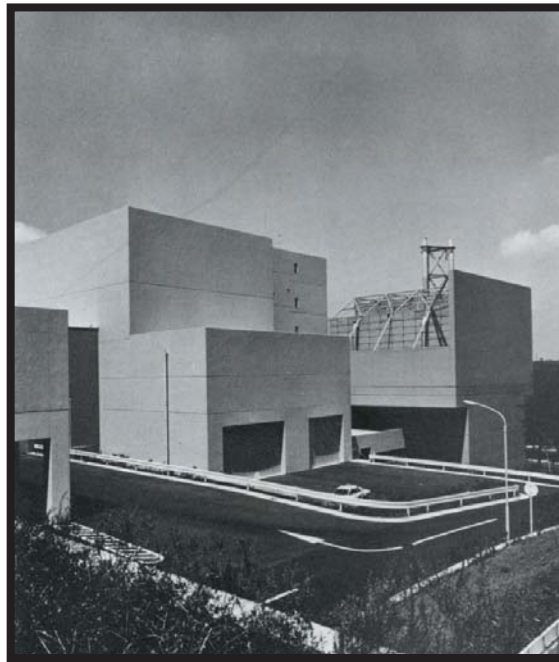
Summary - Typological Research

The case studies examined were the Machida Recycling Center, Materials Recycling Facility (MRF), Warren Skaaren Environmental Learning Center, and the BRING Planet Improvement Center. They were all designed around trying to better the world through recycling. Consideration was also given to how recycling centers have changed over the years.

Starting in Japan, a waste and recycling facility (1982) was studied for its very industrial form and function which provided information on how energy produced could be used as a sustainable feature of the design.

Next, the Materials Recycling Facility (1990) of Springfield, MA, was studied for its very commercial design. It was also interesting to see where the architect took inspiration from and how the design was created by doing so. Overall it was a successful take on a recycling facility in close proximity to a residential environment.

The Warren Skaaren Environmental Learning Center (2003) in Round Mountain, TX, was studied for its educational aspect and sustainable design. The fun atmosphere and learning environment provide the community and surrounding areas a place to learn and engage sustainable design.



Case Studies



Finally, the BRING Planet Improvement Center (2010) was studied for its aspect of community involvement. BRING provides the community and local businesses the opportunity to buy reusable goods, which cuts down on the use of natural resources. Even local contractors use this facility to buy building materials for local design.

As a group, these case studies were all designed around the idea of sustainability (some more than others) and taking recycled materials and creating something more than just a rectangular building that sorts through waste.

Aspects of structure, natural light, massing, plan to section/elevation, circulation to use-space, geometry and additive or subtractive were all studied for each design, with the exception of the quick study. This information, stemmed from the Clark and Pause formal evaluation of case studies, provides an in-depth look at each design individually.

Together, while using the ideals of the theoretical premise/unifying idea, these case studies provided a wide variety of information (sustainability, community, industry) and will help in the next phase of design. However, studies will not stop at this point and continued research will be needed to provide the best facility for Stanley, ND.



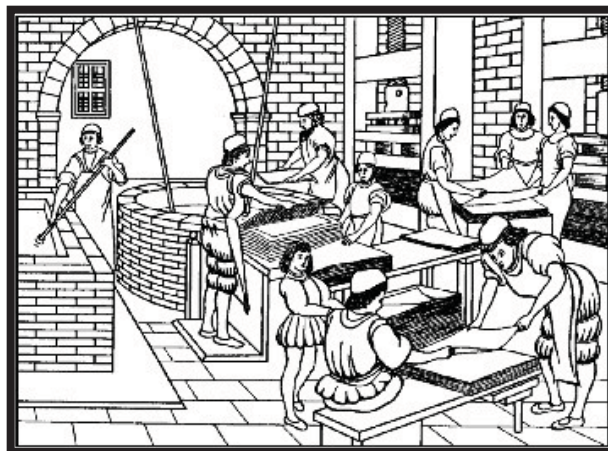
Historical Context

The History of Waste and Recycling

According to WasteOnline, an online document library in the UK, early pre-industrial waste was mainly composed of ash from fires, wood, bones, bodies and vegetable waste. People burned or buried their waste where it would act as a compost and improve the soil. Everything was repaired and reused because populations were small, people lived in less concentrated areas and access to excess goods was minimal. However, as city populations increased, space for disposal decreased, and societies had to begin developing waste disposal systems.

According to California EPA's (Environmental Protection Agency) "The Illustrated History of Recycling," around 10,000 BC, garbage started to become a problem. The main reason was people were establishing permanent settlements and could no longer leave their garbage behind. Instead, they had to learn how to dispose of their trash, which is where we first start to see the challenge of waste disposal. However, in 1600 BC, religious, utilitarian and social conventions started to play a major role in establishing sanitary practices in the ancient world. For example, the Jewish code of sanitary laws obligated individuals to be responsible for removal of their own waste. It wasn't until 500 BC that the first municipal dump was established by Athens in the western world, requiring disposal of waste to be at least one mile from the city walls.

In 105 AD, paper was invented in China by Ts'ai Lun, who lived and served as an official at the Chinese Imperial Court at the Han Dynasty in China. He used recyclable materials such as bamboo, tree skin and shabby cloth to make paper. Ts'ai Lun kept his invention a secret for five decades until a couple of his paper makers were captured by Arabs, leading to the spread of paper across the world ("The Illustrated History of Recycling", 1997).



(Figure H1 - Makki, A.I. "From Papyrus to Paper")



Historical Context

Later, in the year 200, the first sanitation force was created by the Romans, requiring teams of two men walking along the streets, picking up garbage and throwing it into a wagon ("The Illustrated History of Recycling"). Recently, in 1992, bronze artifacts from an ancient shipwreck were discovered off Brindisi's Adriatic coast by a local scuba-diver while on a pleasure outing. There, archaeologists excavated the underwater site uncovering a wide array of parts from many different sculptures scattered in a narrow area in approximately 50 feet of water. The artifacts discovered were statues taken from the Roman Empire's Balkan and eastern Mediterranean provinces. The artifacts ranged in date from the fourth century BC to the third century AD. What was, in fact, uncovered was the first tangible proof of the trade in bronze (among other metals) for recycling in ancient times. The main theory behind the reason to recycle was a political rather than an economic one. As the Roman Empire expanded and new areas were conquered, the population needed to be pacified in order to secure the areas under Roman control. One psychological way to accomplish this was to remove the figures and idols from the public squares of the place recently conquered. This way, the Romans could remove the old, worn statues, transport them back to Italy and melt them down for their own use, thus creating one of the first recycling programs, not for sanitary reasons but for political status (Brindisi Bronzes, 1995).



In 1031, Japan began the first recorded use of waste paper for making new paper and in 1690, the Rittenhouse Mill near Philadelphia created paper from the fiber derived from recycled cotton and linen rags ("The Illustrated History of Recycling", 1997).

(Figure H2 - "A Brief History of Recycling in New York City")



Historical Context

As America declared its independence from England in 1776, rebels turned to recycling to provide material to fight the war, including scrap metal, paper and rags. As history moved on, recycling began to provide resale value and in 1840, men with “backpacks” and horse-drawn carts collected and recycled anything they could find of value (“The Illustrated History of Recycling”, 1997).

In 1865, the Salvation Army was founded in London, England, and began collecting, sorting and recycling unwanted goods. This led to curbside recycling, which began in 1874 in Baltimore, MD. New York City followed and appointed Col. George E. Waring as “Street-Cleaning Commissioner” in 1895. Col. Waring began a system requiring households to sort organic wastes, paper, ashes and street sweepings into separate containers for collection. Then, in 1897, New York City created a materials recovery facility (MRF), where trash was sorted and separated into various grades of paper, metals and carpet (“The Illustrated History of Recycling”, 1997).

Starting in 1904, the nation’s first can recycling plants opened in Chicago and Cleveland. In Chicago, the city jail initiated a unique recycling experiment as it put prisoners to work collecting and sorting waste materials in 1916. From 1916 through 1918, during World War I, the federal government created the Waste Reclamation Service with the motto “Don’t Waste Waste — Save It.” It wasn’t until 1935 that the first aluminum can for beverages was manufactured by a brewer in Newark, NJ. The can weighed three ounces, which was heavy compared to 60 years later, when cans weigh a half an ounce. Those cans, along with many other materials (mostly metals) were recycled to support U.S. and Allied troops during World War II in 1939-1945. In fact, during that time, many government campaign programs urged citizens to donate their metals and conserve fibers as a matter of patriotic importance (“The Illustrated History of Recycling”, 1997).



(Figure H3 - “Cone Top Cans”)



Historical Context



(Figure H4 - "Rationing and Recycling" Rations)

In mid-1942, Americans were issued ration books for sugar. By December 1942, a driver could buy only four gallons of gasoline each week. These unused ration stamps (Figure H4 - Rations) with fighter plane illustrations are from War Ration Book 3 ("Rationing and Recycling").

In 1964, the first all-aluminum can was introduced and one year later, the Solid Waste Disposal Act was passed by Congress, the first significant recognition of trash as a national issue. Five years later, the first national Earth Day was held on April 22, founded by Wisconsin Sen. Gaylord Nelson. The U.S. government then established the U.S. Environmental Protection Agency (EPA) that same year as a response to the public's growing environmental concerns. Its office of Solid Waste began to examine the problems caused by generating and disposing waste. The EPA also passed the Resource Recovery Act through Congress to shift the emphasis of federal involvement from disposal to recycling, resource recovery and the conversion of waste into energy. Overall, the 1970s were very productive years for recycling and waste acts and issues ("The Illustrated History of Recycling", 1997).



(Figure H5 - Duse, Eleanor. "How Recycled Aluminum Can Crafts Work")

There were also many improvements in bottle/container designs, along with the design of the recycling symbol itself. The recycling symbol was designed by Gary Dean Anderson; a student at the University of Southern California, in 1970 for a nation wide contest sponsored by Container Corporation of America (a paperboard company). The new recycling symbol was to be used to identify packages made from recycled and recyclable fibers, and to call attention to paper recycling as an effective method of conservation of our natural resources (Dyer, J.C., 2004). In 1972, Oregon passed the first "bottle bill" in the U.S. requiring consumers to pay a deposit on bottles and cans, to be redeemed when the container was recycled. Then, in 1973, chemist Nathaniel Wyeth patented the polyethylene terephthalate (PET) plastic bottle, which led to the California Beverage Container Recycling and Litter Reduction Act of 1986: placing a deposit on aluminum cans, glass and plastic bottles. Finally, in 1995, Americans recycled a record 47.6 billion soft drink containers and aluminum cans were recycled at a rate of 63% in the U.S. ("The Illustrated History of Recycling", 1997).



Historical Context

History of Stanley, North Dakota

To this day, no one really knows where Stanley got its name. Some think it came from Col. King Stanley who was a well-known pioneer of the area, others believe the name to came from Col. H. Stanley, who was a telegrapher and good friend of George W. Wilson; the founder of Stanley. Either way, something was lost in translation over the years and George W. Wilson is the only one who truly knows. Wilson was born January 28, 1858 in Baltimore, MD. In 1880, Wilson traveled to the Dakota Territory as an employee of the Northern Pacific Railroad. He was deputy sheriff of Buford County in 1888; city auditor of Minot in 1890; and justice of the peace in McHenry County in 1895. He had twice carried Ward County as a candidate for Secretary of State and was chairman of the Republican Party in Ward County. After platting the townsite of Stanley in 1902, Wilson was very active in business affairs and government. As a monument to Wilson, who died in 1935, the park located near the center of town is named after him (Stanley Centennial, 2002).

At one time, Stanley was known as “tank town” due to its water tank built about 54 miles west of Minot. The main reason the towers lettering is faced to the north east is so that incoming trains can read it. When referring to the town of Stanley in 1902, E.H. Sikes wrote, “In January, 1902, I arrived in Stanley which then consisted of the section house, coal shed, two small houses, the depot and two small shacks” (Stanley Centennial, 2002). As the years went on, the town grew, so much so that the old “tank town” had to resolve parking issues near the business district in 1926 and built a new water tank in 1948 (Stanley Centennial, 2002).

The Great Northern railroad had a need for improved water supply, and in 1928 built a dam south of town in Little Knife, providing a reservoir from which water could be pumped through a pipeline for use in their steam engines. In 1952, on Stanley's 50th Jubilee, President Harry S. Truman made a “whistle stop” and briefly spoke to the large crowd that had gathered at the depot to greet him (Stanley Centennial, 2002).



Historical Context

The oil boom began in 1951 and seismograph crews were located in the city. Housing for the additional families who came to the area to work in the oil fields and related businesses was practically non-existent. Residents were asked to open their homes, remodel and rent wherever possible. The first trailer court and a six-unit motel was established in the southwest portion of town to help with this demand. In 1953, Stanley's economy started to boom and the major impact of this was the town's Saturday nights. Local businesses stayed open during the summer on Saturdays because of its great social hour and shopping time. In fact, most of the farm families would only come into town on Saturday night. The Minuteman missile sites in the Stanley area brought more jobs to the area in 1962. Peter Kiewit and Sons completed construction by the end of June 1963. There are currently 39 launch sites and 3 control centers in Mountrail County with a total of 150 missiles (Stanley Centennial, 2002).

It wasn't until 1964 that Stanley began a garbage pickup service; prior to this residents burned their own garbage and also utilized the city dumpground. In the beginning, garbage pickup service fees were \$2 per month for each family residence (Stanley Centennial, 2002).

According to the Mighty Mountrail, Volume II, "On November 18, 1977, the Harstad No.1, a wildcat well located in the NESW sec. 10, T155N, R91W, was completed and flowed 120 barrels of oil per day" (Stanley Centennial, 2002). Through the 1980s and 1990s, more housing was built to house workers for the oil fields along with many other improvements to the town, including a truck route in 1983 to prevent damage to main roads by service vehicles; a pipeline from Tioga and Ray to Stanley that provided them with water in 1993 and 1994 and many other improvements. The town has gone through national crises, building projects, crime, weather, failure and success to be what it is today - more than 100 years old (Stanley Centennial, 2002).



Goals for the Thesis Project

Academic:

Clearly explain the Theoretical Premise/Unifying Idea. This will be the basis for the entire project and research. It provides a problem to be solved and gives meaning to the project.

Have a Typology that is clearly defined and functions as such. Additional spaces will take the typology to the next level, allowing it to reach new heights in its typological design.

Organize and detail a Thesis Program that goes above and beyond the requirements given. This will create opportunities later in design where just meeting the requirements will fall short.

Collect and preserve the design process through sketches, computer designs/models, and any other process I use to produce the final product.

Professional:

Increase my knowledge with known and unknown design programs. I would like to experiment with new programs and see what they are capable of. Furthering my knowledge in programs like Revit, Sketchup, AutoCAD and the like would be beneficial to me in the future.

Create superior graphics and a presentation that is well-organized, complete and well-crafted; one that can be understood without any explanation. The oral presentation will be serious, well-organized and complete.

Increase my knowledge and understanding of building construction and how things are assembled. Learning building codes, assemblies, HVAC systems, electrical and plumbing systems allow for more creative designs. The design can function better as a whole if these categories are looked at during the design and not as an afterthought.



Goals for the Thesis Project

Meet with the people of Stanley, ND at different times during my project design, allowing for critiques and updates to my project. This will not only help me as a designer to get a better feel of what they, as a community, need, but also gives them an idea of what could be done.

Personal:

Meet with my advisor regularly to discuss the progression of my project. This will keep me on track as well as make sure all of my components are completed in a timely manner.

Produce a project that is both professionally and personally satisfying. This goes beyond the academic requirements and will be something I am interested in accomplishing to better myself as a person and as a professional. I want to be proud of the end result with no regrets.

Design a building that Stanley, ND could use to benefit their community as a whole. Nothing would be more satisfying than creating a design that could actually be built for this community. Creating a design that meets all of their recycling needs would be my greatest and most rewarding goal to achieve.

Personally thank Stanley, ND and the people of the community (The mayor and city coordinator specifically) who took time out of their days to help me in my process of designing a Recycling Center for them. Without their help I would have had a really hard time finding city information, history and the overall feeling of the community as a whole.



Site Analysis

Narrative

After the long drive out to Stanley, ND, I met with Heidbreder, Stanley's city coordinator. We talked briefly inside City Hall and he generously gave me some city information maps and booklets before taking me to the site. The drive only took a few minutes, but as we drove up to the site, I immediately fell in love with everything it had to offer: sunlight, water, wildlife, vegetation, fresh air, and more.

With few trees on the site: except for smaller trees near the water's edge, sunlight penetrates from the south with little obstruction and could potentially be used for solar energy. Along with that, water near the site could potentially be used for irrigation, like it is already used for the city golf course to the north.

The water on the site's northeastern edge comes from city water runoff which is then pumped to a reservoir called "Stanley Pond." It is there that the DNR (Department of Natural Resources) populate the pond with catfish and walleye to help clean and filtrate the water. According to Heidbreder, every year on the fishing opener and throughout the season, citizens from the community come out and line the dock (located across Stanley Pond to the northeast) to catch a few fish. Near the docks, families gather at the picnic tables to eat and socialize in a small outdoor park. One can also see the occasional waterfowl who take shelter on the southeastern edge, tucked inside the thick reeds along the shoreline of the water to escape the high winds of North Dakota.

Along with the winds comes the fresh aroma of the clean air that surrounds this site. In the winter months, this wind can be pretty brutal, especially near the water's edge, but in the summer it can be a cool breeze you seek after a hard days work. In dry times there may be the occasional dust from the dirt road, but for the most part, with help from nearby trees and bodies of water, the air smells very clean despite all of the oil boom activity around town.



Site Analysis

To the south of the site you can see a group of houses lined with evergreens and a variety of deciduous trees. To the west, it is mostly open space with intermittent trees and a couple of homes, and its not until you get back on the grid that a neighborhood appears. To the north, more storage facilities come in to view and off in the distance, located to the northwest, you can see the Stanley water tower. Next to the water tower is the historical Mountrail County Courthouse.

The site itself is located off of Reservoir Rd. just outside of town to the northeast. There, you will find a small yellow metal-paneled building that houses Stanley's compacting dumpster and storage space. According to Heidbreder, the existing building, although small, has all of its utilities (electricity, water, gas and telephone) and around the building they use this space as storage for old cars and a roll-out garbage container filled with tires.

To the south of the existing building lies more open space for additional use. According to Ward, this area is used as bulk storage for rock, sand, and gravel, but will be moved soon to a different location. Quite a few vehicles seem to have gone through this space because the ground is torn up, earth has been shifted from one area to another and tire tracks can be seen throughout the prairie grass that dominates this landscape.

Suprisingly, with all of the vehicles that have moved through this space, the area is pretty quiet. In the distance you can hear the sounds of large trucks hauling oil or water and a train, but to this community, that's normal boomtown activity.



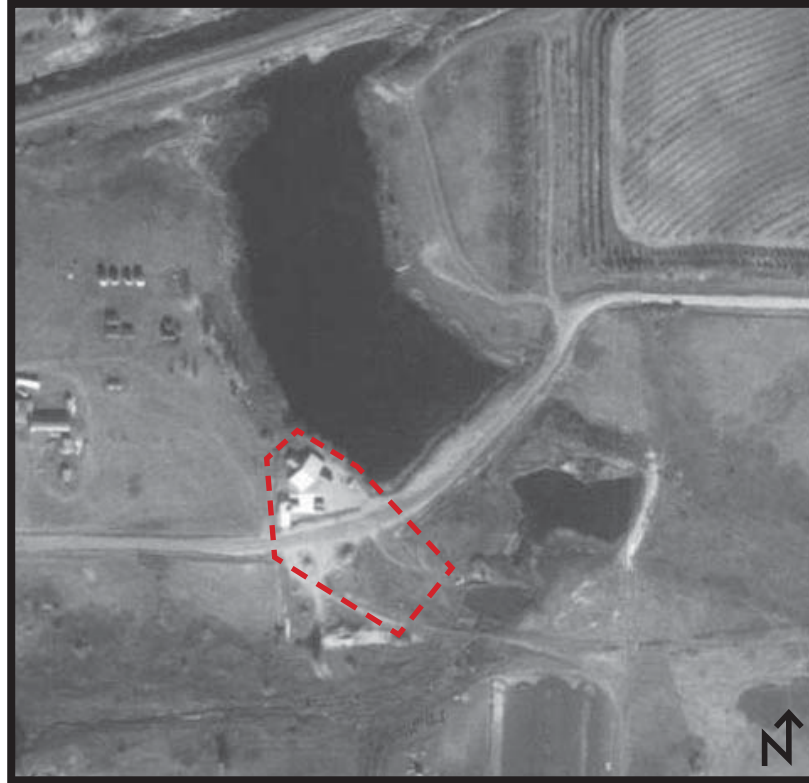
Site Analysis

Grids

There is not a city grid attached to this site location. The site is located outside of the urban environment allowing for a lot of free-form characteristics to the site, like the nearby pond.

Textures

There are a variety of textures at this site location. To the northeast is an agricultural field which has a changing texture throughout the seasons. There is the smooth texture of water to the north and east of the site. The water to the east, however, comes and goes as it gets pumped to the pond to the north. The gravel road has its own rocky, sandy texture and in certain parts, it is more smooth than others depending on use and vehicular traffic. Vegetation in the area also gives the land its texture of flowing grass and fluttering leaves of the trees as the wind blows through.



(Bing Maps - 5)

Soils / Water Table

According to the USDA (United States Department of Agriculture), the soils for this site and much of Mountrail County and Stanley are mostly Williams-Zahl loams, 3 to 6 percent slopes or Zahl-Williams loams, 9 to 25 percent slopes. Both soils are well-drained and contain much of the same characteristics and compositions.

Williams-Zahl loams (3 to 6 percent slopes):

Depth to water table: More than 80 inches

Drainage class: Well-drained

Mean annual precipitation: 14 to 17 inches

Zahl-Williams loams (9 to 25 percent slopes):

Depth to water table: More than 80 inches

Drainage class: Well-drained

Mean annual precipitation: 14 to 17 inches



Site Analysis



(Frick, Ben - 1)

Built Features

Existing on the site currently is a building used for storage and a compacting dumpster. Behind the building is a small assortment of old cars and a roll-out garbage dumpster full of used tires and other garbage bins for storage. Other than that, there is a fence surrounding this building and a few telephone poles for utility services.

Utilities

The site currently has access to all utilities including electricity, water, sewage, and gas, all available through the building on the site and underground. The main power station is located northwest of the site.

Water

There is water adjacent to the site location. As you can see on the previous page in figure Bing Maps - 5, there is Stanley Pond to the north and a water runoff pond to the east of the site. Stanley Pond, as pictured below, is a water reservoir used to water the Stanley Golf Course located to the north of Stanley Pond. Water is taken from the runoff area and pumped to Stanley Pond where fish (mostly catfish and walleye) and vegetation clean the water. The dock (shown below) is used by local residents to fish and socialize during the open season.



(Frick, Ben - 2)



(Frick, Ben - 3)



Site Analysis

Vehicular Traffic

There is light traffic along Reservoir Rd., but the high traffic areas are either U.S. Highway 2 or N.D. Highway 8. Reservoir Rd. is actually 1st Ave. SE in town, but once you exit the city it becomes Reservoir Rd. Its main use is for service vehicles to use the excess gravel, sand and dirt piles or to dump garbage at the compacting building.

Pedestrian Traffic

There is very minimal, if any, pedestrian traffic along Reservoir Rd. Most people drive to the fishing dock if they want to go fishing, other than that you will only see service vehicles or wildlife crossing or using this road.

Human Characteristics

Humans have transformed this site to what it is today. The road and building located on the site were man made along with all of the utilities powering the site. The water pump to take the water runoff to Stanley Pond was also influenced by man. A fence was constructed and put around the building and surrounding storage space outside to keep intruders out and the materials inside safe.

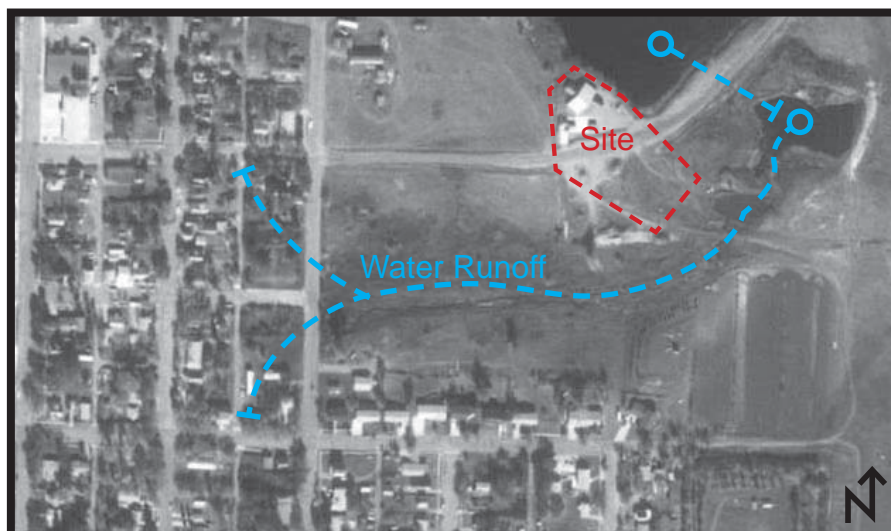
Site Character / Distress

There is no erosion, muddy water, empty stores or dying trees on site. However, there is a designated water runoff area directly to the east of the site. Water travels from the city of Stanley toward the runoff area, through a canal that runs south of the site, leading to the marsh-like area; where it is pumped to Stanley Pond. From Stanley Pond, excess water is used to water the golf course to the North.

Start  End



(Bing Maps - 6)



Site Analysis

Light Quality

There are both hard and soft lighting conditions at this site. On a nice sunny day this site is warmed and lit by the sun, causing very bright and very dark areas both in the same scene. However, cloudy days offer soft light with no harsh shadows or intense bright spots.

The light itself even brings with it colors that change depending on the conditions. Early or late in the day (sometimes called the “magic hour” by photographers), light creates a warm golden glow from the sun and cold temperatures in a snow-covered landscape can be conveyed with a bluish noon-hour light, all of which are offered in this climate of North Dakota.

Wind

Besides the existing building on the site, there are no obstructions of wind. The site is far enough from the built environment of the city that wind is free to circulate without obstruction. Stanley Pond cools the wind and this can be felt near the water's edge.



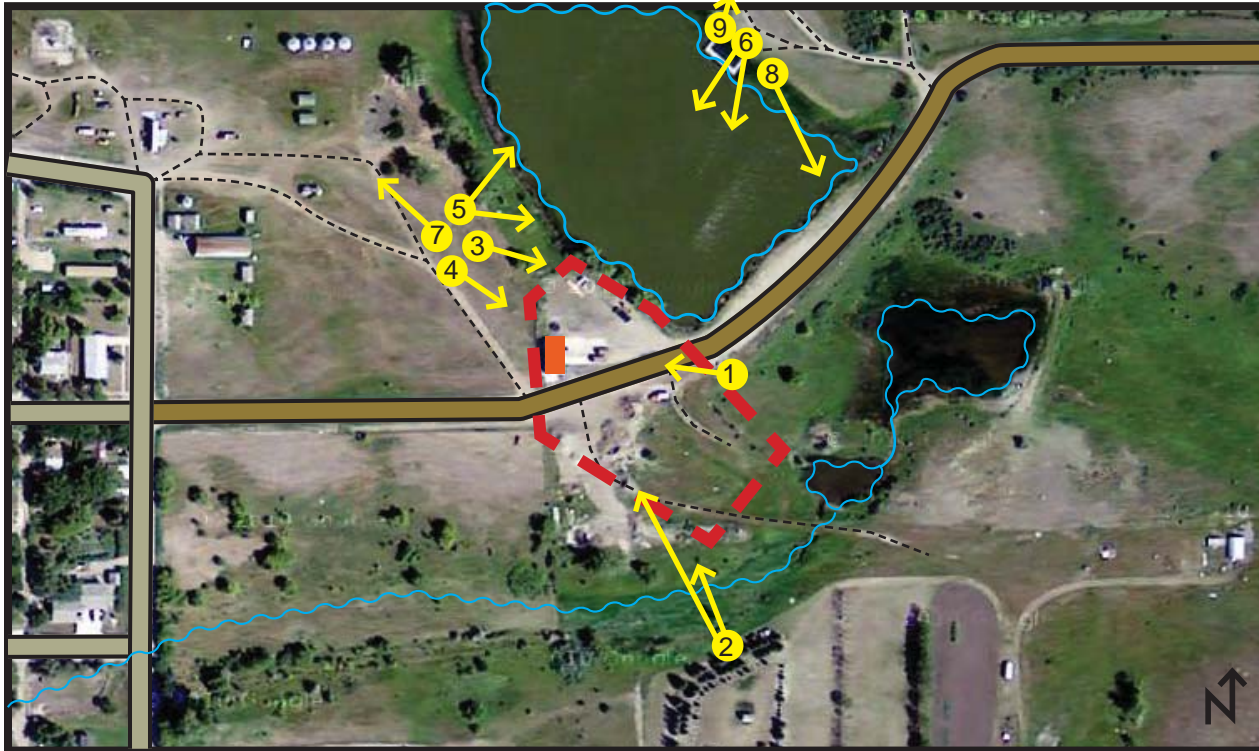
(Frick, Ben - 4)



Site Analysis

Base Map / Photogrid

(Bing Maps - 7)



Key

Paved Road:		Foot Path:	
Dirt Road:		Existing Structure:	
Site Boundary:		Photo Taken/Direction:	
Water:			



View from east off Reservoir Rd.

1



Site Analysis



View from south (distant shot)

(Frick, Ben - 6)



View from south (close-up shot)

(Frick, Ben - 7)



View from northwest of storage

(Frick, Ben - 8)



Site Analysis



(Frick, Ben - 9)



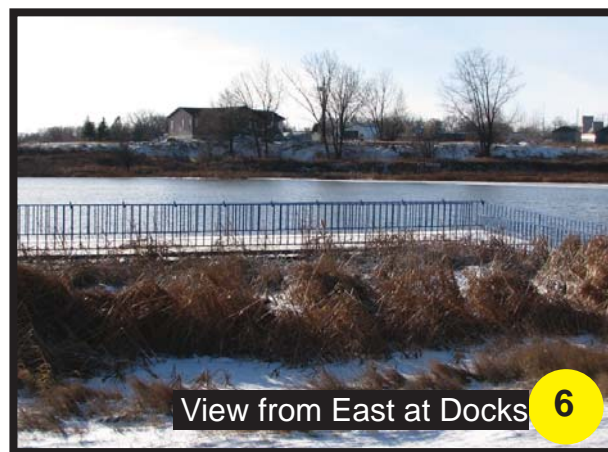
(Frick, Ben - 10)



(Frick, Ben - 11)



(Frick, Ben - 12)



(Frick, Ben - 13)



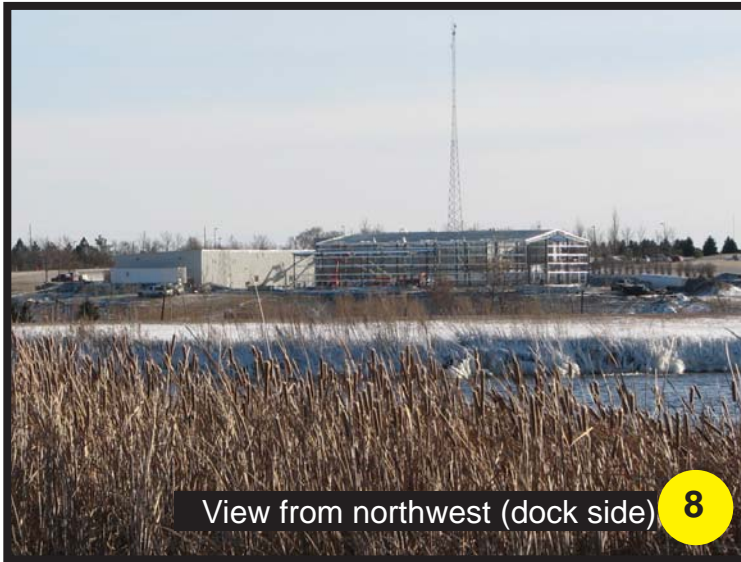
Site Analysis



View from southeast (water tower/courthouse)

7

(Frick, Ben - 14)



View from northwest (dock side)

8

(Frick, Ben - 15)



View from southwest (small picnic space)

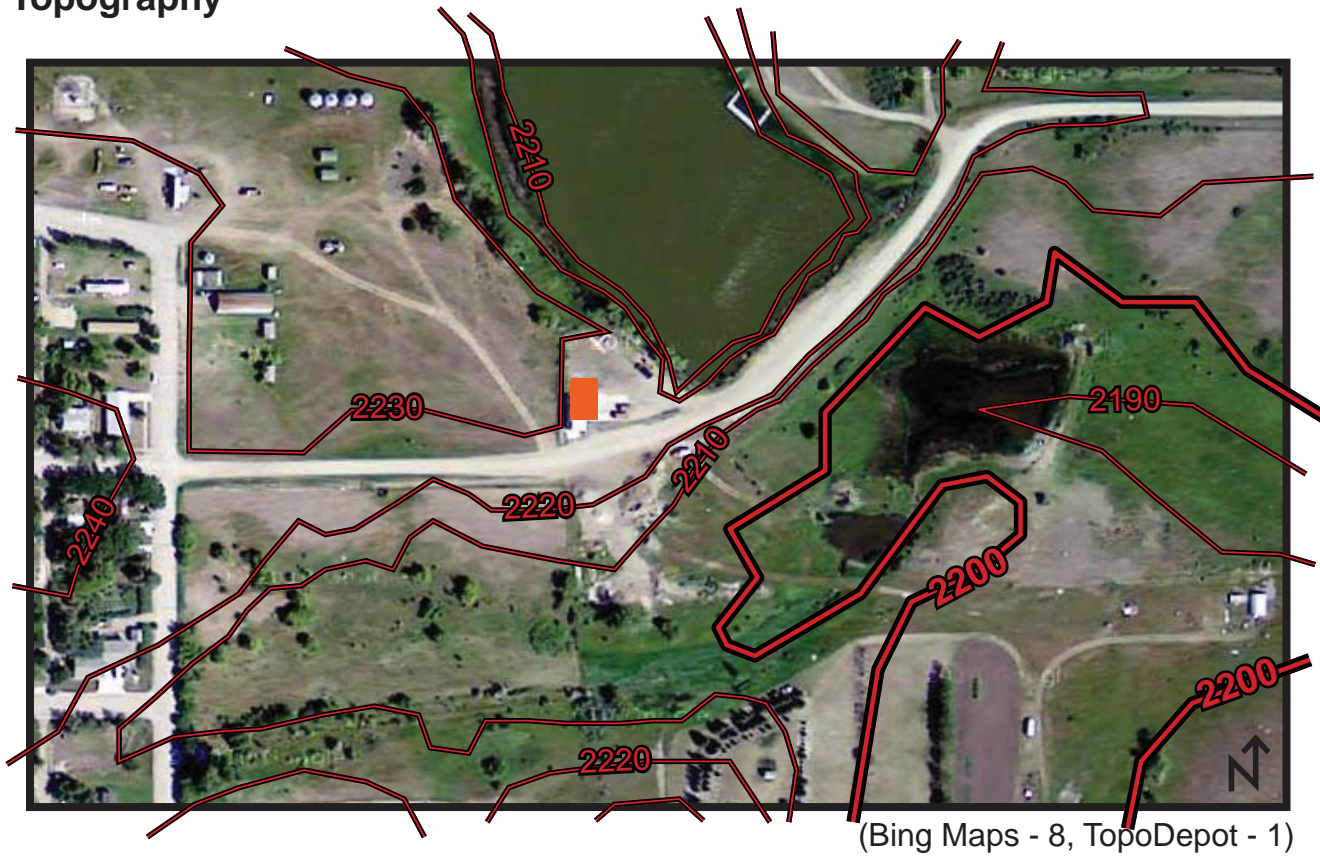
9

(Frick, Ben - 16)

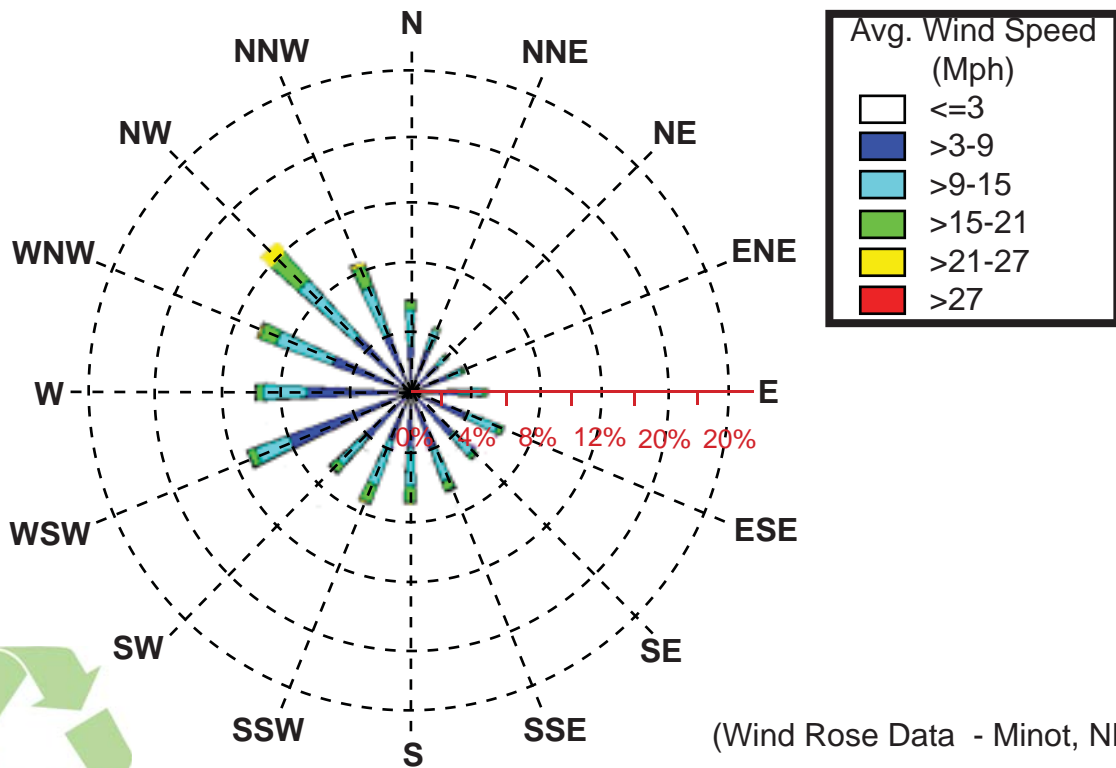


Site Analysis

Topography



Wind Rose

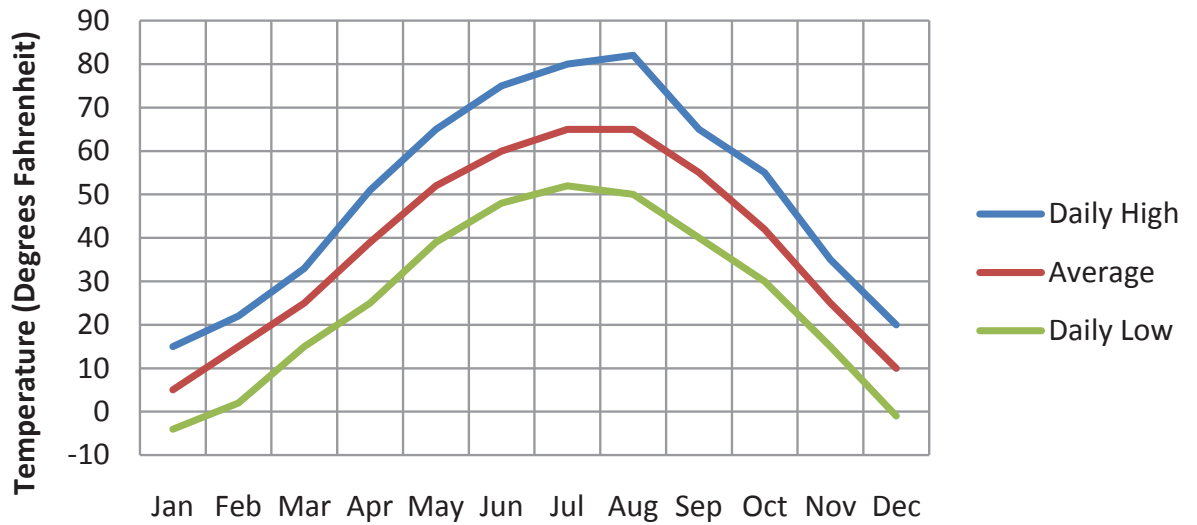


Site Analysis

Climate Data

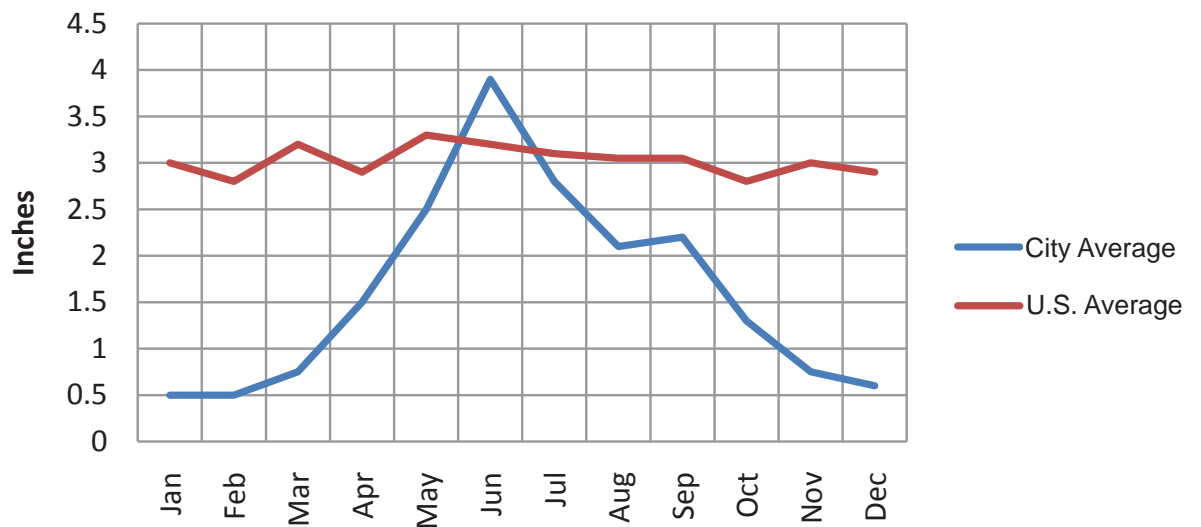
(City Climate Data - 1)

Average Temperature



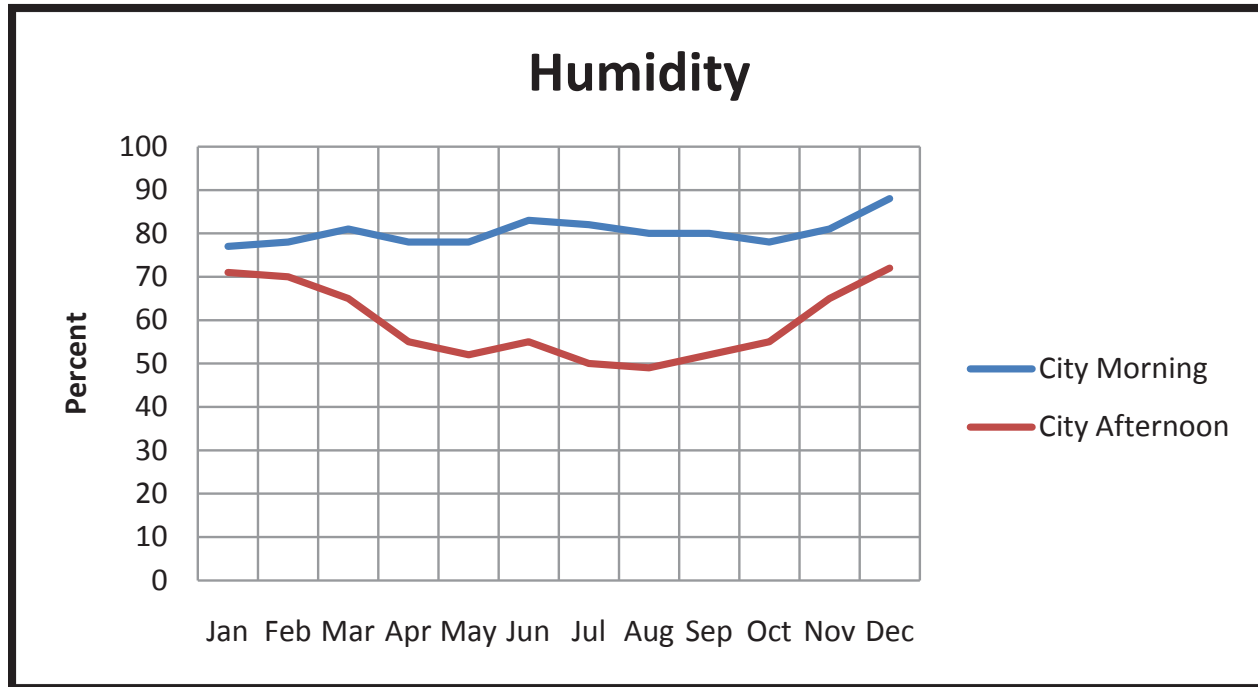
(City Climate Data - 2)

Precipitation

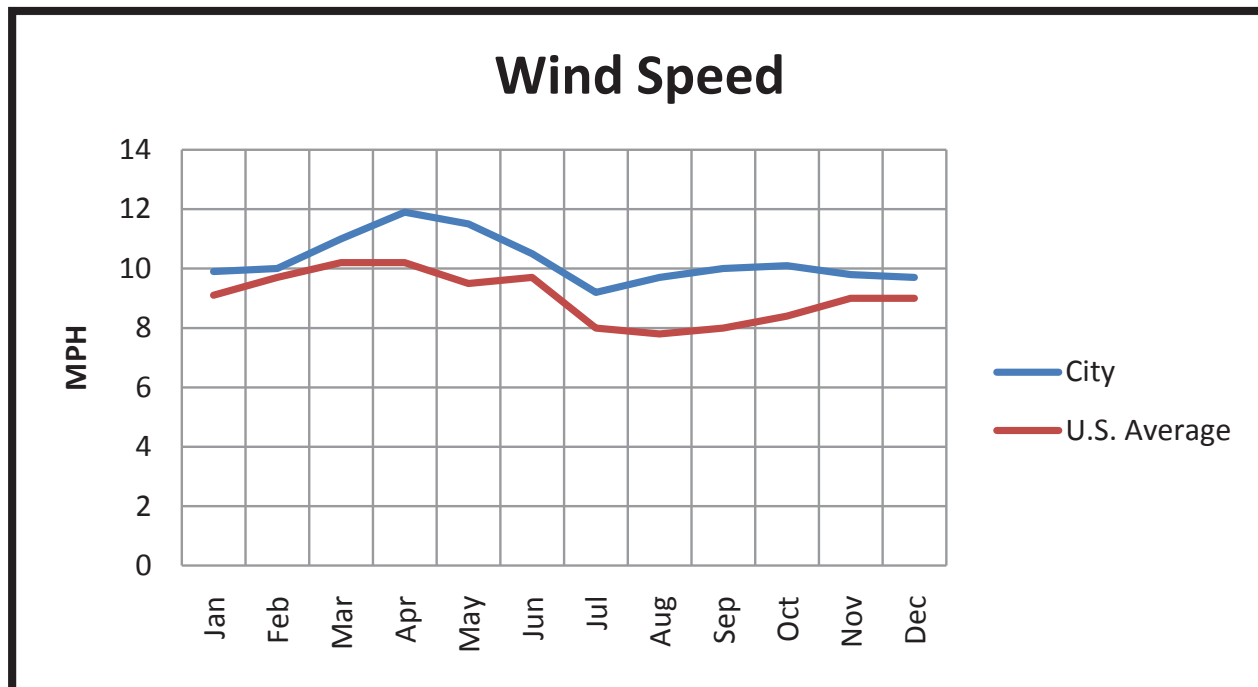


Site Analysis

(City Climate Data - 3)

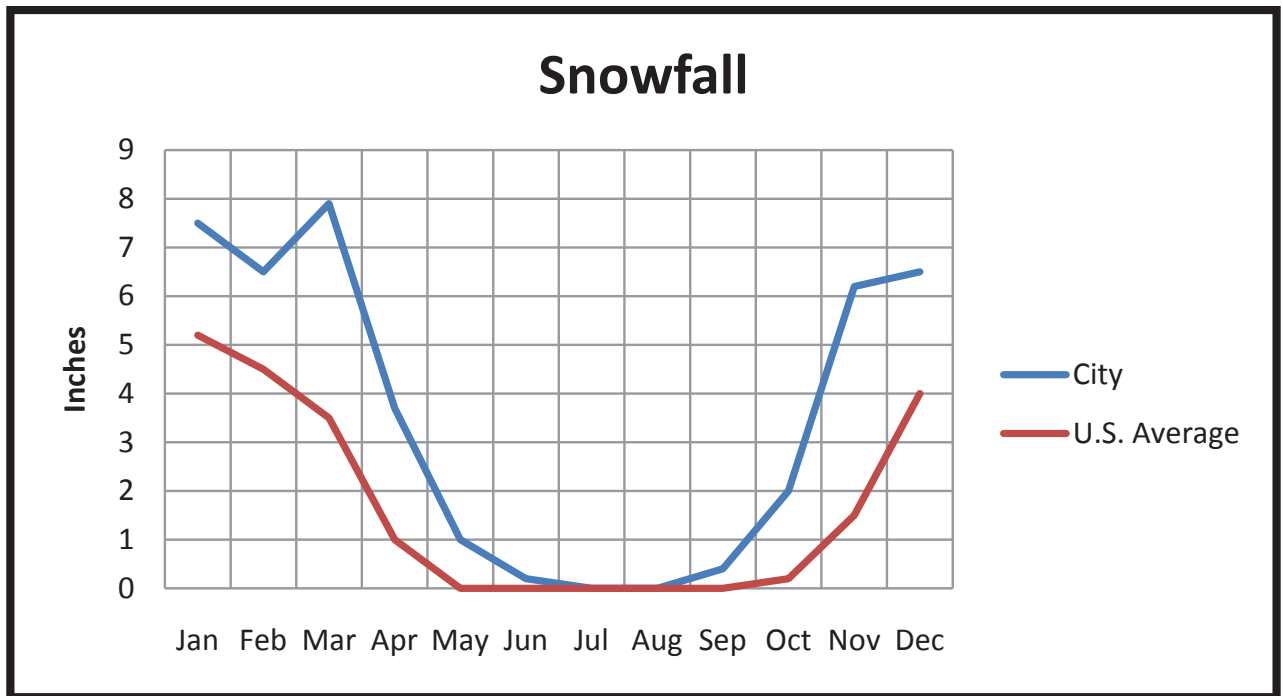


(City Climate Data - 4)

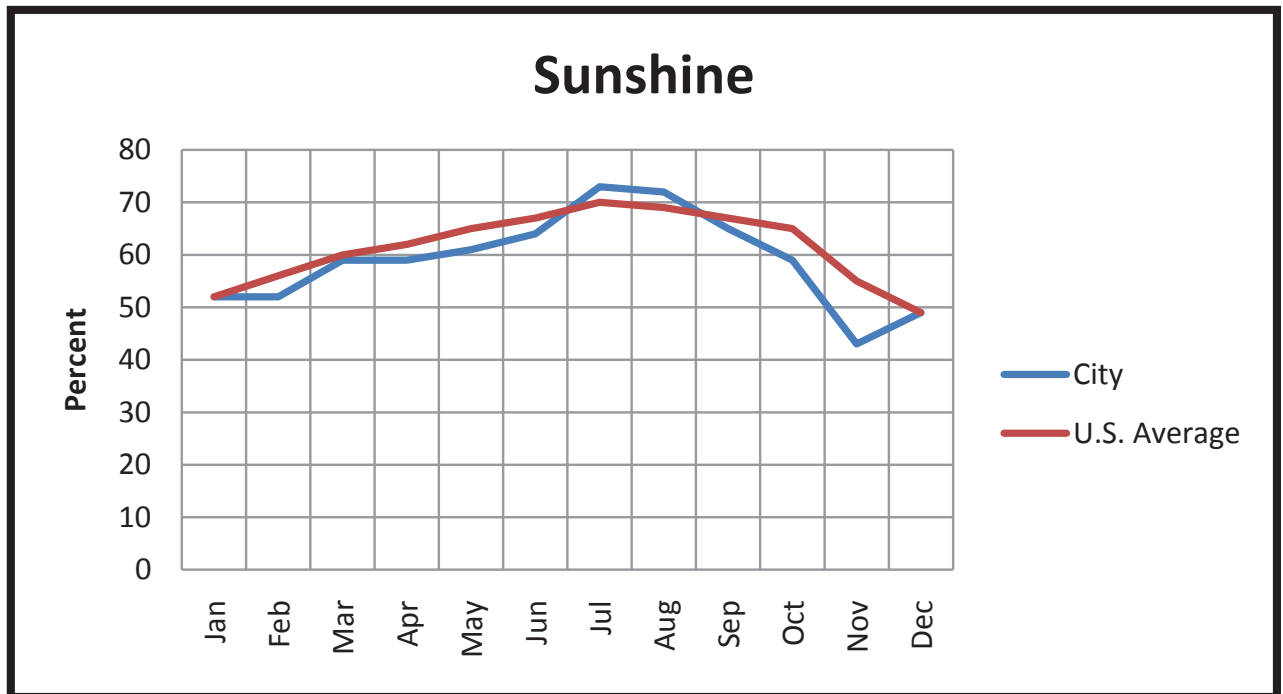


Site Analysis

(City Climate Data - 5)



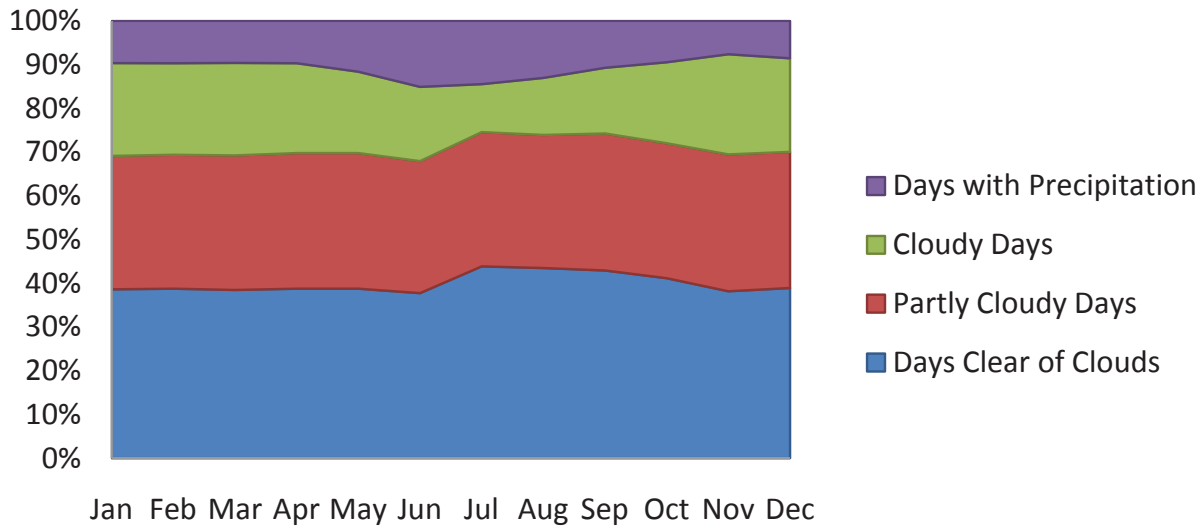
(City Climate Data - 6)



Site Analysis

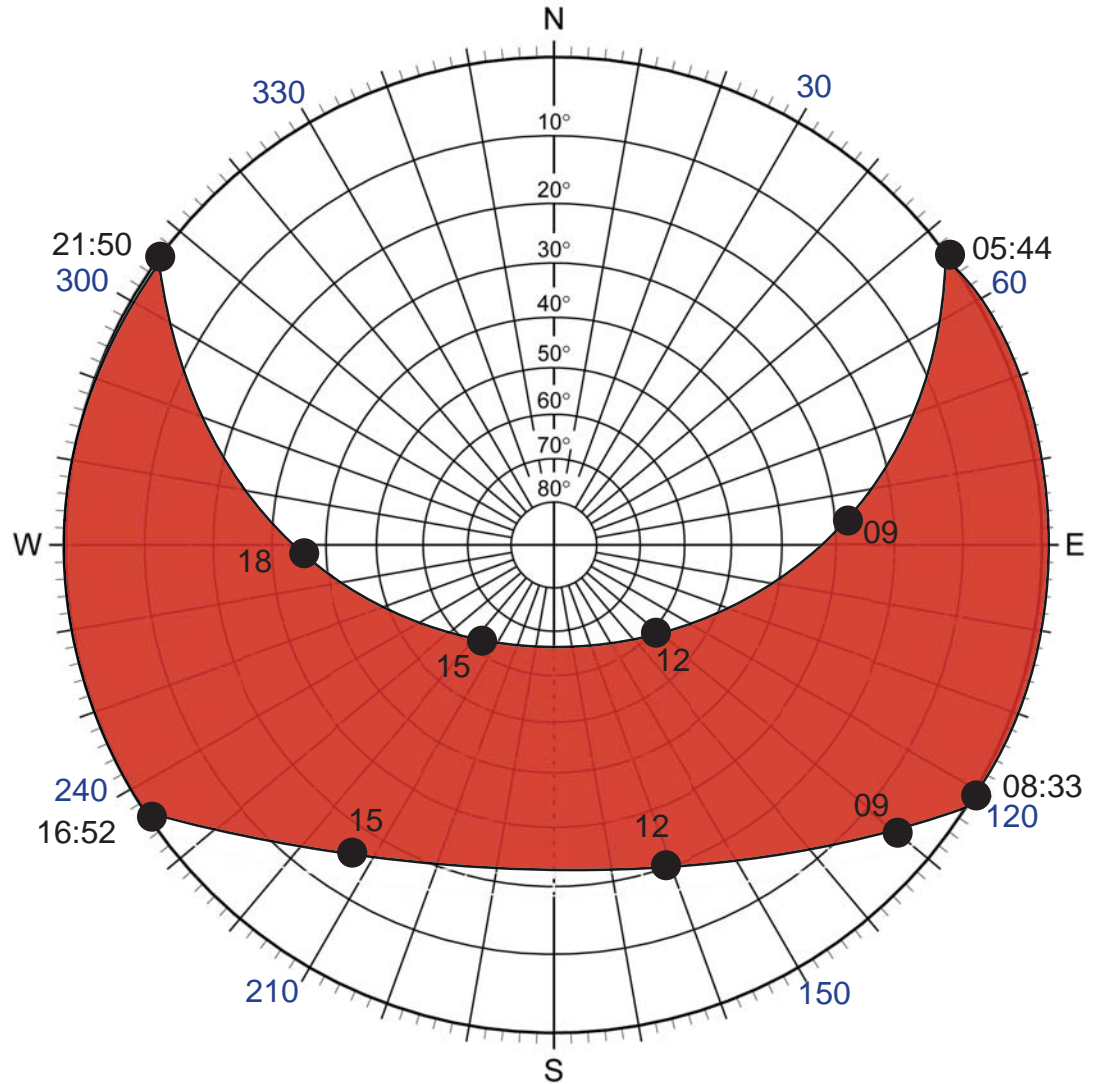
(City Climate Data - 7)

Cloudy Days



Site Analysis

Sun Path Diagram



(Sun Path Diagram - Minot, ND)



Programmatic Requirements

Scale for Trucks: 70 ft² (7'x10')

Loading Dock: 2800 ft² (40'x70')

Education Space: 4200 ft² (60'x70')

Observing Tower: 400 ft² (20'x20')

Hydraulic Elevator Inside

Working Floor: 9600 ft² (80'x120')

Offices: 1200 ft² (30'x40')

Restrooms: 600 ft² (30'x20')

Outdoor Garden/Park: 26000 ft² (130'x200')

Additional Storage: 1500 ft² (30'x50')

Additional Storage Space Outside in Containers/Semi Trailers

Employee/Visitor Parking: 25 spaces @ 9'x19'

Additional Space for Bus Parking



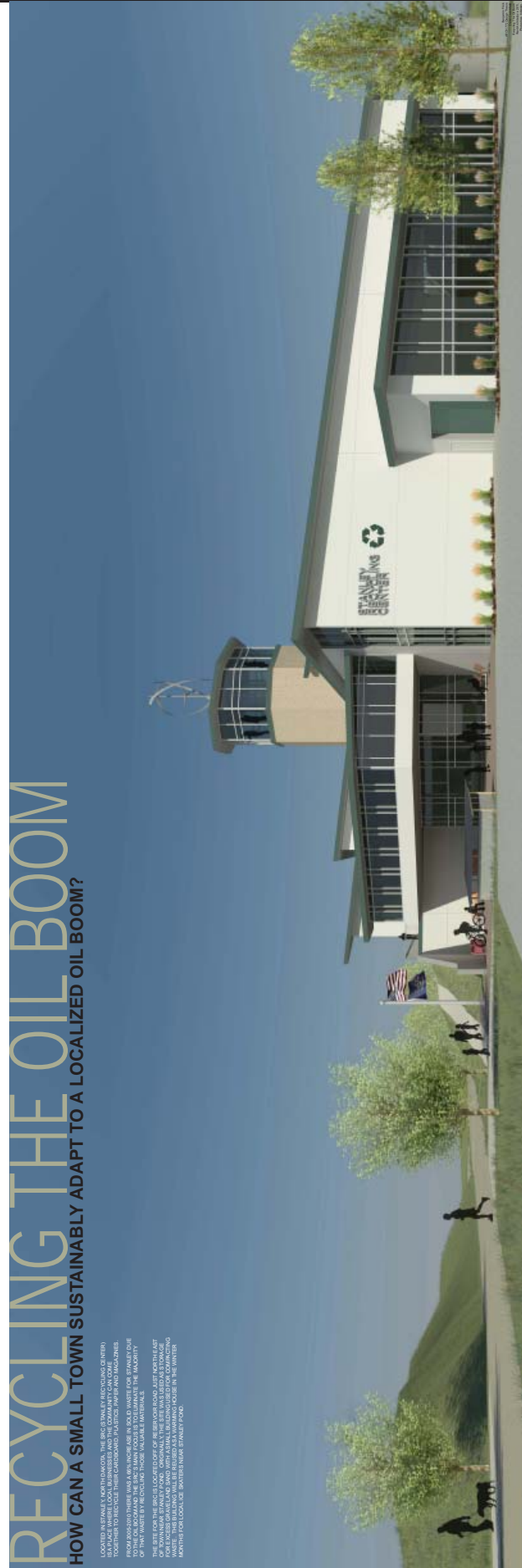
RECYCLING THE OIL BOOM

HOW CAN A SMALL TOWN SUSTAINABLY ADAPT TO A LOCALIZED OIL BOOM?

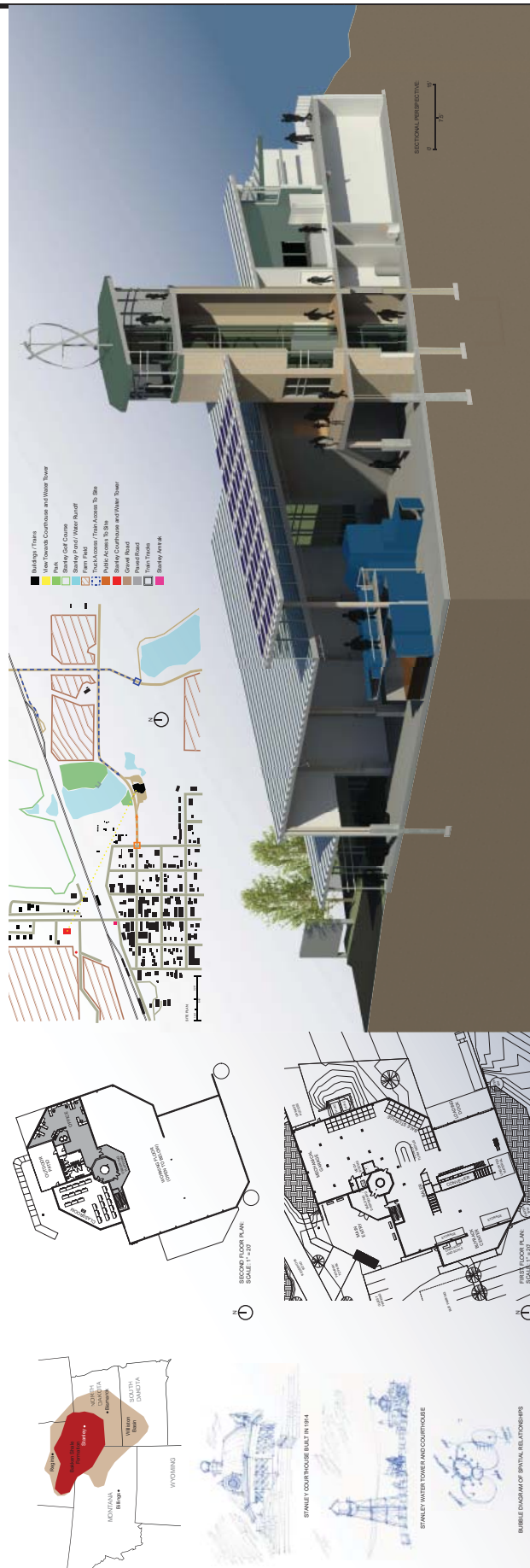
LOCATED IN THE HEART OF NORTH DAKOTA, THE BIG SHELBY RECYCLING CENTER IS A PLACE WHERE LOCAL BUSINESS AND THE COMMUNITY CAN COME TOGETHER TO RECYCLE WASTE. THE CENTER IS A 100,000-SQ-FT FACILITY THAT WILL BE THE ONLY OF ITS KIND IN THE AREA. THE CENTER WILL BE THE ONLY FACILITY OF ITS KIND IN THE AREA. THE CENTER WILL BE THE ONLY FACILITY OF ITS KIND IN THE AREA.

THE SITE FOR THE BIG SHELBY RECYCLING CENTER IS LOCATED OFF OF THE ROUTE 1 ROAD, JUST NORTH OF THE TOWN OF SHELBY. THE SITE IS A 100-ACRE PARCEL THAT WAS ACQUIRED BY THE TOWN OF SHELBY IN 2010. THE SITE IS A 100-ACRE PARCEL THAT WAS ACQUIRED BY THE TOWN OF SHELBY IN 2010.

THE SITE IS A 100-ACRE PARCEL THAT WAS ACQUIRED BY THE TOWN OF SHELBY IN 2010. THE SITE IS A 100-ACRE PARCEL THAT WAS ACQUIRED BY THE TOWN OF SHELBY IN 2010.



Final Presentation Boards



Final Presentation Boards

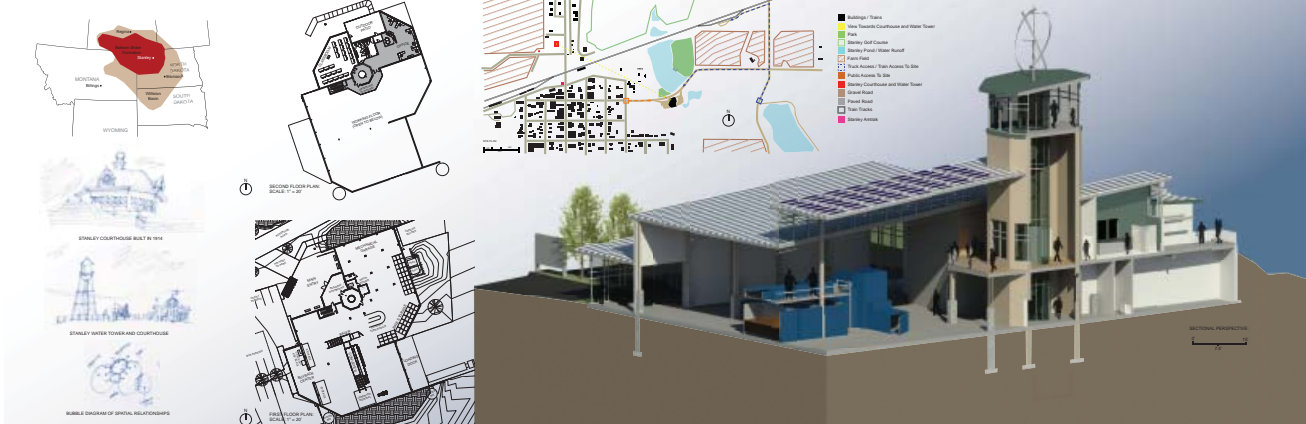


Final Presentation Boards

RECYCLING THE OIL BOOM

HOW CAN A SMALL TOWN SUSTAINABLY ADAPT TO A LOCALIZED OIL BOOM?

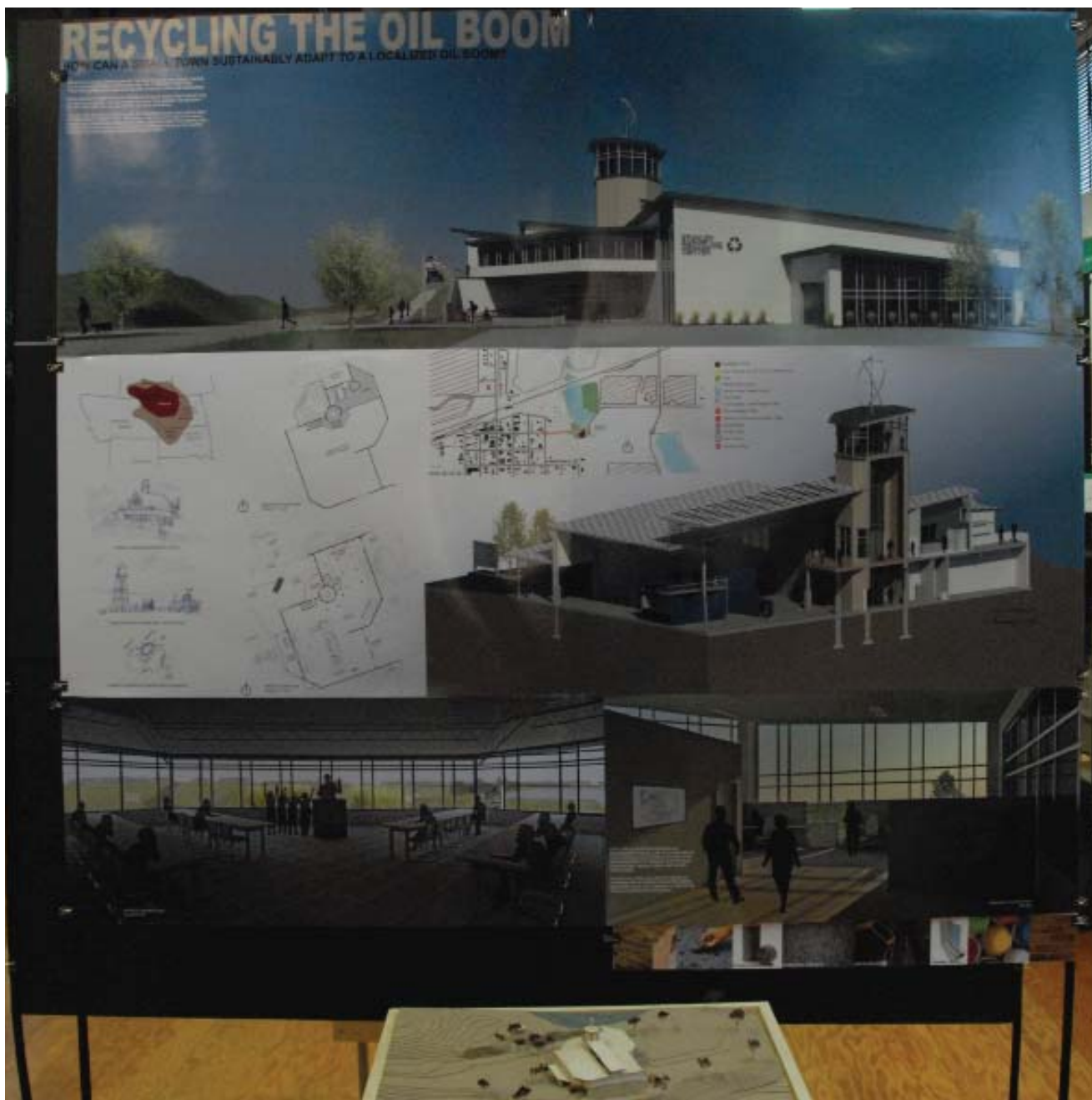
LOCATED IN A REMOTE AREA, THE DESIGN OF A RECYCLING CENTER AS A PLACE WHERE LOCAL BUSINESS AND THE COMMUNITY CAN COME TOGETHER TO RECYCLE THEIR CONSUMER PLASTIC, PAPER AND METALS. PROVIDING THEM WITH A SAFE PLACE TO DISPOSE OF THEIR WASTE AND TO LEARN ABOUT THE OIL BOOM AND ITS EFFECTS ON THE ENVIRONMENT. THE FACILITY WILL BE A COMMUNITY CENTER AND A PLACE WHERE THE COMMUNITY CAN COME TOGETHER TO RECYCLE THEIR WASTE AND TO LEARN ABOUT THE OIL BOOM AND ITS EFFECTS ON THE ENVIRONMENT. THE FACILITY WILL BE A COMMUNITY CENTER AND A PLACE WHERE THE COMMUNITY CAN COME TOGETHER TO RECYCLE THEIR WASTE AND TO LEARN ABOUT THE OIL BOOM AND ITS EFFECTS ON THE ENVIRONMENT.



Final Presentation Model



Final Presentation



Reference List

- AIA/COTE. "The Warren Skaaren Environmental Learning Center". Apr. 2006. Nov. 2010. <<http://www.aiatopen.org/hpb/overview.cfm?ProjectID=660>>
- "An Industrial Basilica: Materials Recycling Facility." *Progressive Architecture* Dec. 1991: 68. Nov. 2010.
- Ammons, A.R. (1993). *Garbage*. New York: Norton.
- "Brindisi Bronzes" *National Geographic* 187 (4); April 1995; P. 88-101.
- "BRING Recycling." Reduce, Reuse, Recycle at Bring Recycling Center. 2010. Nov. 2010. <<http://www.bringrecycling.org/>>.
- Dyer, J.C. (2004) "The History of the Recycling Symbol: How Gary Anderson Designed the Recycling Symbol." Feb. 2011. <http://www.dyer-consequences.com/recycling_symbol.html>
- Engler, Mira. (2004) "Waste Recycling/Reuse Institutions." *Designing America's Waste Landscapes*. Baltimore: J. Hopkins UP.
- Hopper, R., and Mielsen, J.M. (1991). "Recycling as Altruistic Behavior: Normative and Behavioral Strategies to Expand Participation in a Community Recycling Program." *Environment and Behavior* 23, (2): 195-220.
- "INFORUM Fargo, ND." Fargo Moorhead News, Sports and Weather, INFORUM. Fargo, ND. 07 Oct. 2010 <<http://www.inforum.com/pages/runningwithoilmaps>>.
- Kelly. (1973). *Garbage: The History and Future of Garbage in America*. New York: Saturday Review Press.
- Lynch. (1972). "Managing Transitions." *What Time Is This Place?* Cambridge, Mass.: MIT Press.
- McLaughlin. (1998). *Dirt: A Social History Seen Through the Uses and Abuses of Dirt*. New York: Dorset Press.
- Muschamp. (1993). "When Art Is a Public Spectacle." *New York Times*, August 29, B31.
- Online Etymology Dictionary, (2010) <<http://dictionary.reference.com/browse/recycling>>
- Oskamp. (1991). "Factors Influencing Household Recycling Behavior." *Environment and Behavior* 23, (4): 494-519.



Reference List

- Pawley. (1982). *Building for Tomorrow: Putting Waste to Work*. San Francisco: Sirerra Club Books.
- "Rationing and Recycling." Michigan Historical Museum. 2008
<<http://www.hal.state.mi.us/mhc/museum/explore/museums/hismus/1900-75/arsenal/rationing.html>>
- Strasser. (1999). *Waste and Want: A Society History of Trash*. New York: Metropolitan Books.
- "Stanley, North Dakota (ND 58784) Profile. 06 Dec. 2010.
<<http://www.city-data.com/city/St Stanley-North-Dakota.html>>.
- Stanley Centennial. Stanley, ND, 2002.
- "The Illustrated History of Recycling" (1997) California Environmental Protection Agency, California Department of Conservation.
<www.p2pays.org/ref/26/25070.pdf>
- "Machida Recycling Center." The Japan Architect. 1982. Nov. 2010.
- Thompson. (1926). *Rubbish Theory: The Creation and Destruction of Value*. New York: Oxford University Press.
- Tierney. (1996). "Recycling is Garbage" *New York Times Magazine* pps. 24-29,44,48,51,53.
- Welcome to the USGS - U.S. Geological Survey. 07 Oct. 2010.
<<http://www.usgs.gov/>>
- Welcome Page for Stanley, ND. 07 Oct. 2010.
< <http://www.stanleynd.com/index.asp?Type=NONE&SEC={8F702CAD-DC99-4BB0-A211-7EB21099C2D6}>>.
- Wilson. (1993). "Firmness Commodity and Delight in the Junkyard." *Blueprints* 11, (3): 2-6
- "Web Soil Survey." USDA Soil Information - Home. 06 Dec. 2010.
<<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>>



Reference List

Images:

Bing Maps 1-8. 2010. Nov. 2010. <<http://www.bing.com/maps/>>

City Climate Data 1-7. 2010. Nov. 2010
<<http://www.city-data.com/city/Stanley-North-Dakota.html>>

Frick, Ben. 2010. Images 1-16

H1 - Makki, A.I. "From Papyrus to Paper" Oct. 2005. Nov. 2010.
<<http://www.alshindagah.com/septoct2005/papyrus.html?>>

H2 - "A Brief History of Recycling in New York City" 2010. Nov. 2010.
<http://www.nyc.gov/html/nycwasteless/html/recycling/recycling_history.shtml>

H3 - "Cone Top Cans" Aug. 2008. Nov. 2010. <<http://www.boxvox.net/film/page/2/>>

H4 - "Rationing and Recycling" Nov. 2010.
<<http://www.hal.state.mi.us/mhc/museum/explore/museums/hismus/1900-75/arsenal/rationing.html>>

H5 - Duse, Eleanor. "How Recycled Aluminum Can Crafts Work" 2010. Nov. 2010.
<<http://tlc.howstuffworks.com/family/recycled-aluminum-can-crafts.htm>>

Shutterstock Images. "Oil Pump Clip Art" 2010. Nov. 2010.
<http://www.google.com/images?as_q=oil+pump+clip+art>

Sustainable Development for All. Oct. 2009. Nov. 2010. <<http://www.leedsstudent.org/2009-10-04/life-and-style/features/sustainable-development-for-all>>

Sun Path Diagram - Minot, ND. 2010.
<<http://www.gaisma.com/en/location/minot-north-dakota.html>>

Wind Rose Data - Minot, ND. 1991-2005. Nov. 2010
<<http://www.ndsu.edu/ndsco/windrose/mino.html>>



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A Quote About NDSU

"Life is a series of Opportunities and Pitfalls.
The trick is to avoid the Pitfalls,
Seize the Opportunities,
and be home by 5 o'clock."
-Woody Allen

